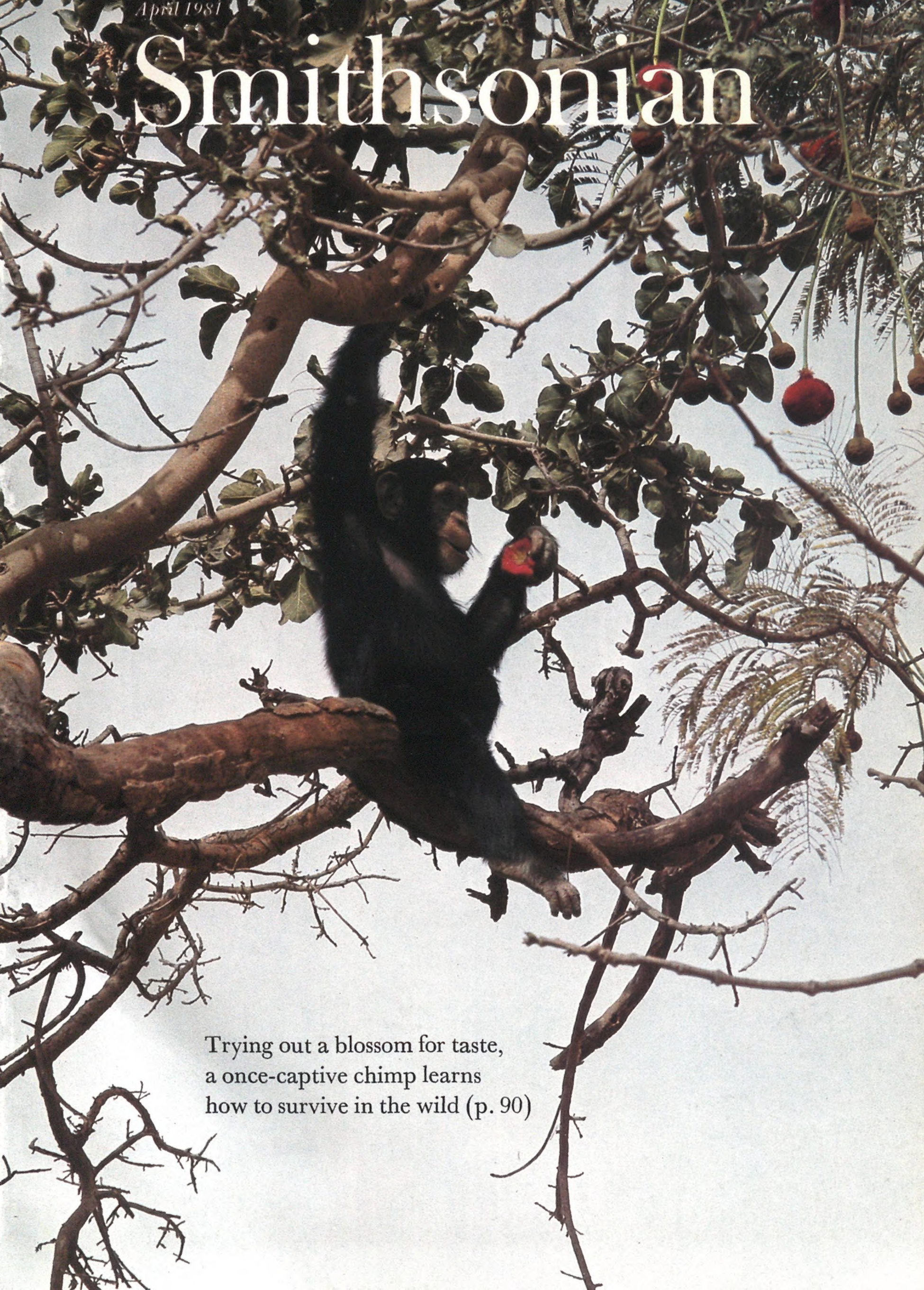
April 1981

Smithsonian



Trying out a blossom for taste,
a once-captive chimp learns
how to survive in the wild (p. 90)

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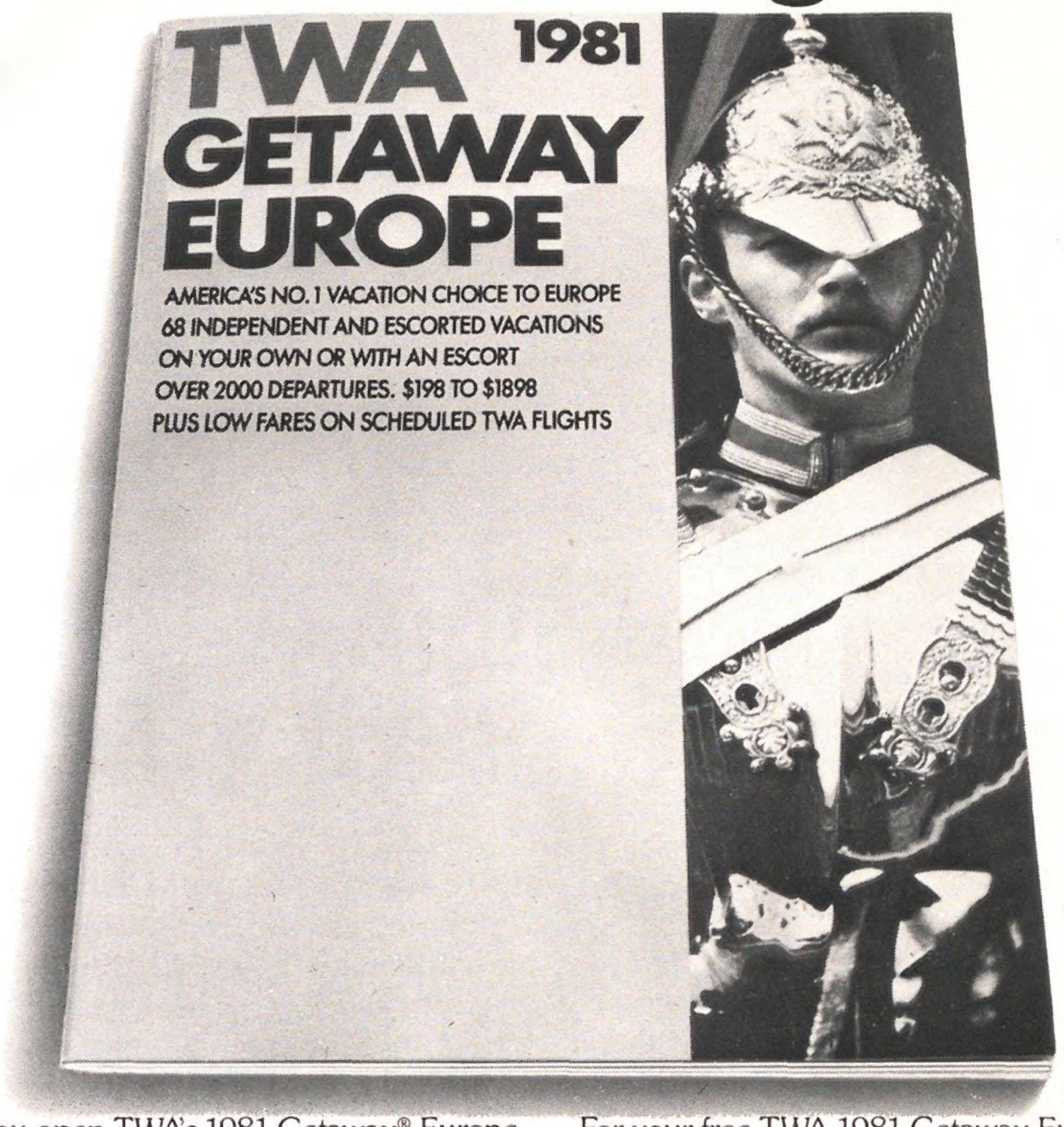
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Smithsonian (ISSN 0037-7333) is published monthly by the Smithsonian Associates, 900 Jefferson Drive, Washington, D.C. 20560.
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Subscription price $14 a year in U.S. and possessions, $22 elsewhere. Single copy price $1.25. Second-class postage paid at Washington, D.C.
Editorial offices, 900 Jefferson Drive, Washington, D.C. 20560.
Advertising and circulation offices at 420 Lexington Ave., New York, New York 10170.
Members: Please address all subscription correspondence and change of address information to P.O. Box 2955, Boulder, Colo. 80322
Postmaster: send 3579s to P.O. Box 2955, Boulder, CO 80302

April 1981

Smithsonian

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86 PROOF BLENDED SCOTCH WHISKY DISTILLED AND BOTTLED IN SCOTLAND. IMPORTED BY THE BUCKINGHAM CORPORATION, NEW YORK, N.Y.

HERE'S TO GUT FEELINGS AND THOSE WHO STILL FOLLOW THEM.

Ted "Captain Outrageous" Turner

Ted Turner does lots of things people advise him not to do. And he succeeds at them. He turned Atlanta's WTBS-TV into a "Superstation" using a communications satellite and recently founded Cable News Network, the world's first 24-hour TV news network. He bought the Atlanta Braves and moved them out of last place; won the 1977 America's Cup after being fired in the '74 races; and was named "Yachtsman of the Year" four times.

Ted Turner puts his feelings where his mouth is. He also puts a great scotch there: Cutty Sark. And while he's been called Captain Outrageous by some, one thing's sure: Ted Turner's enjoying himself.

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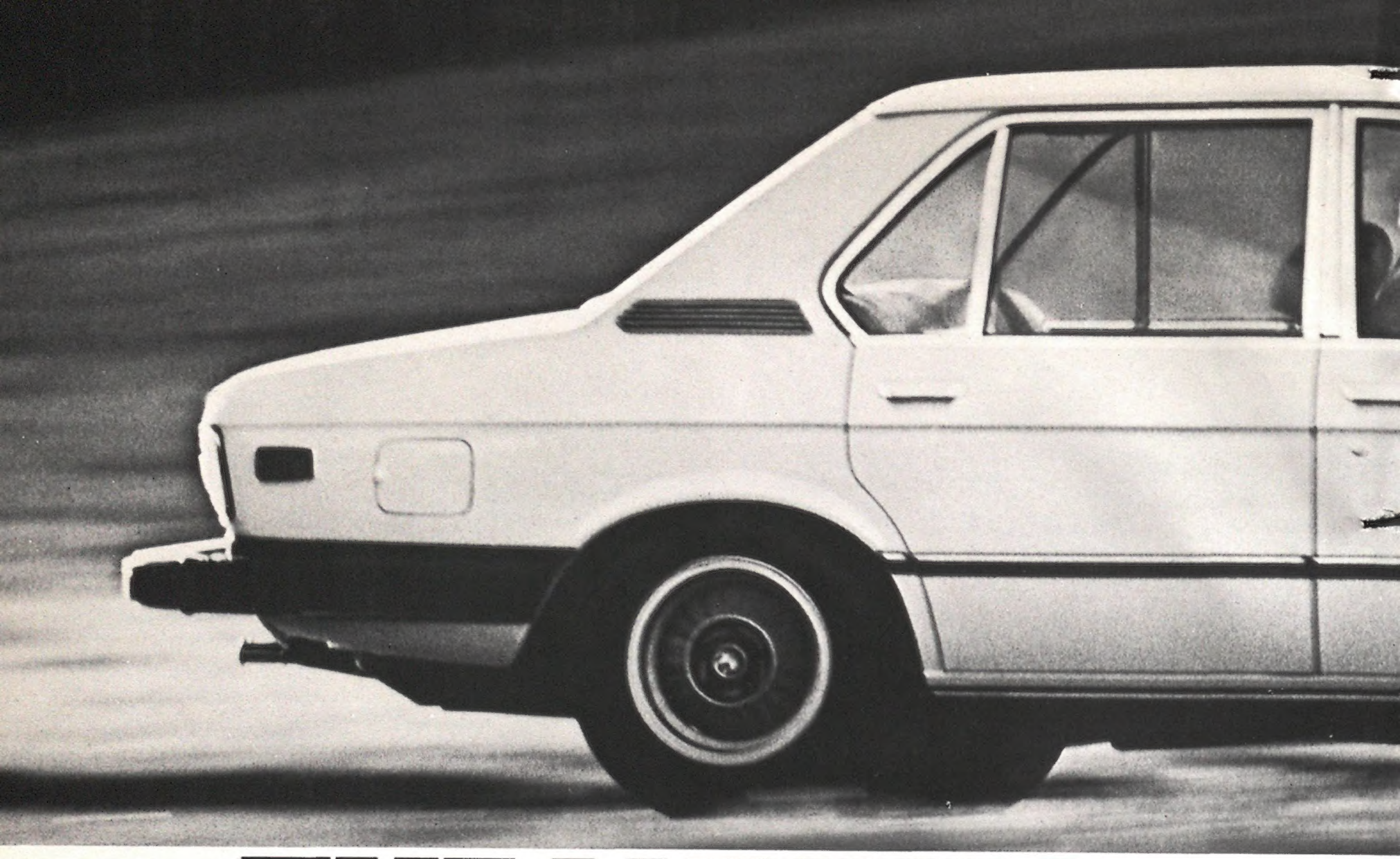
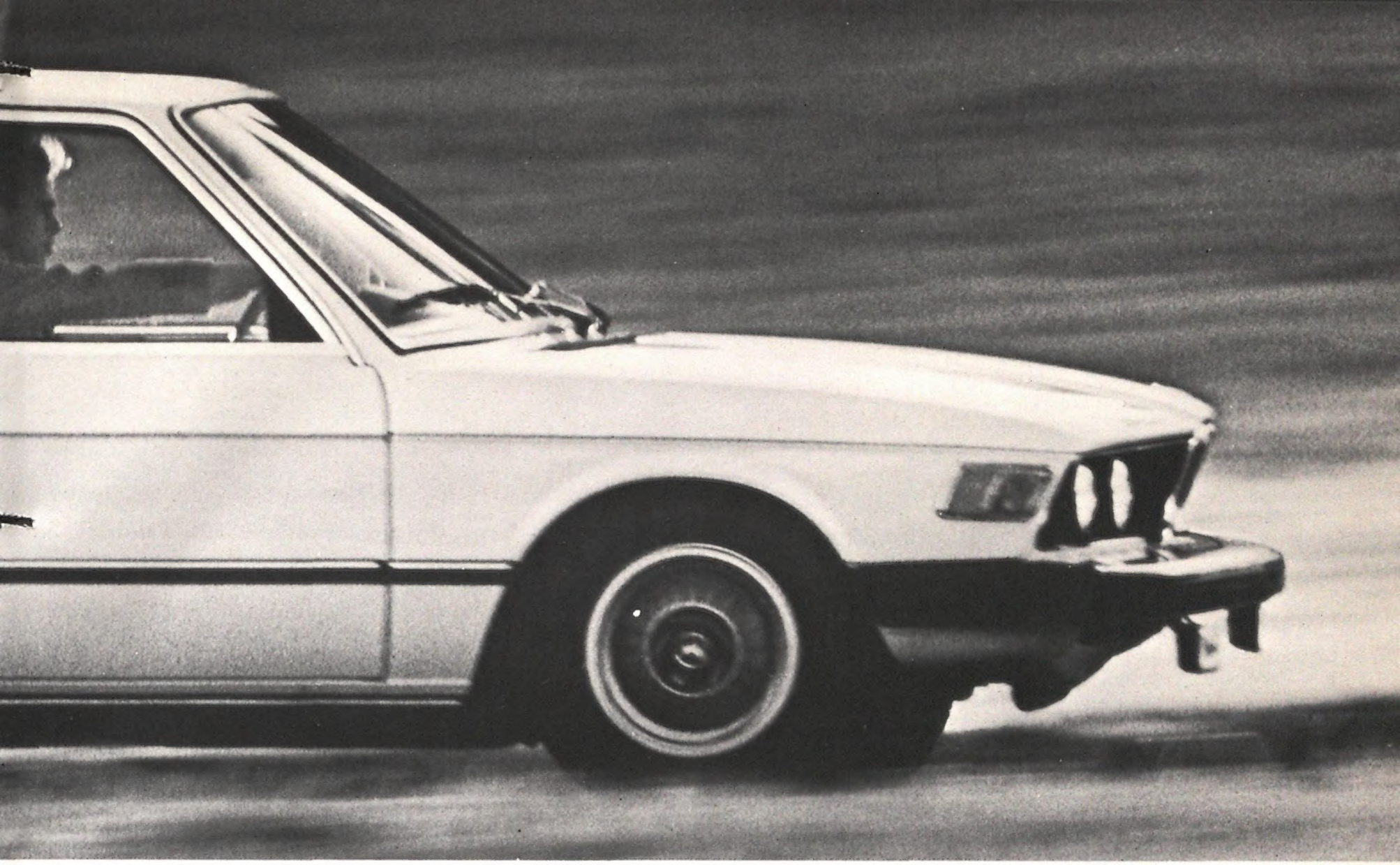


THE LUXURY SEDAN THAT DID NOT HAVE TO BE RE-ENGINEERED TO FACE DIFFICULT TIMES.



Will the trials and tribulations of the automobile industry never end?

First came the Environmental Protection Agency and the need to re-engineer to meet the emission requirements.

Then came the gas crises and the need to re-engineer to meet the demands of the gas pump.

Then came last year's money crunch and the most serious challenge of all: the enlightened consumer.

And, with a certain predictability, the luxury sedan makers of the world reacted by bringing forth a slew of "revolutionary" new automobiles, each radically re-engineered to answer the perfectly reasonable question, "What is it that makes an expensive car worth the money?"

A question perhaps uniquely answered by the BMW 528i.

TECHNOLOGY DECADES AHEAD OF THE COMPETITION.

As some of the world's most exalted automobile manufacturers rush to update anachronistic technology—cutting cylinders, resorting to diesel fuel, tinkering with all manner of electronic gadgetry—one caveat should be observed: evolution, as any automotive expert will testify, is always far preferable to revolution. We are, after all, dealing with a machine made up of several thousand parts.

Which is perhaps the most convincing argument for owning the BMW 528i. A car developed and refined over two decades. An engineering concept so basically sound that an era of automotive restrictions has, if anything, proven it to be even more correct.

A SYNERGISTIC USE OF ELECTRONICS AND MECHANICS.

Car and Driver magazine has seen fit to predict, "In the not-too-distant future, most cars will be equipped with some form of electronic fuel injection simply because it is a more precise fuel-delivery system."

Far from just beginning to dabble in the sophisticated arena of electronics, BMW installed such a system in 1975.

With every engine revolution a computer receives and assesses signals from electronic sensors within the 6-cylinder engine itself. Then instantly determines the precise air/fuel mixture to be injected into the cylinder ports—optimizing emissions, fuel consumption and power development to a degree once considered merely within the realm of academic theory.*

So flawless is this marriage of electronics and mechanics that it has resulted in a virtual automotive paradox: an engine which not only performs with more fuel efficiency but with more power as well.

THE DRIVER COMPLETES THE MECHANICAL CIRCUIT.

The interior of the 528i, while classically restrained in style, denies its occupants nothing with regard to appointments or accessories.

But, perhaps because of our involvement with motor racing, we take a wholly different approach to the interior of an automobile.

An approach which includes the driver as a functioning part of the car.

A standard 5-speed transmission (automatic is available) affords the unaccountably unique opportunity to pick and choose one's own gears.

An advanced suspension system—independent on all four wheels—provides what one automotive journalist hailed as "a confidence-inspiring stability." Giving the driver an uncanny feel for the road.

EXTRAORDINARY ENGINEERING IS AN EXTRAORDINARY INVESTMENT.

BMW has always contended that only one thing makes an expensive car worth the money: Extraordinary engineering.

The BMW 528i has itself turned that contention into fact.

For, according to the Oct. 1980 NADA Used-Car Guide, over the past 5 years, the 5 Series has retained an astonishing 77.9% of its original price.

A figure which neither the Mercedes 280E, nor the Jaguar XJ6, nor Cadillac can approach.

If you find the notion of owning a BMW intriguing, phone your nearest BMW dealer and arrange a thorough test drive.

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*For example, the BMW 528i (with 5-speed standard transmission) delivers 18 EPA estimated mpg, 30 estimated highway mileage and, based on these figures, an estimated mpg range of 295 mi. and a highway range of 492 mi. (Naturally, our fuel efficiency figures are for comparison purposes only. Your actual mpg and range may vary, depending on speed, weather and trip length. Your actual highway mileage and highway range will most likely be lower.) © 1981 BMW of North America, Inc. The BMW trademark and logo are registered trademarks of Bayerische Motoren Werke, A.G.

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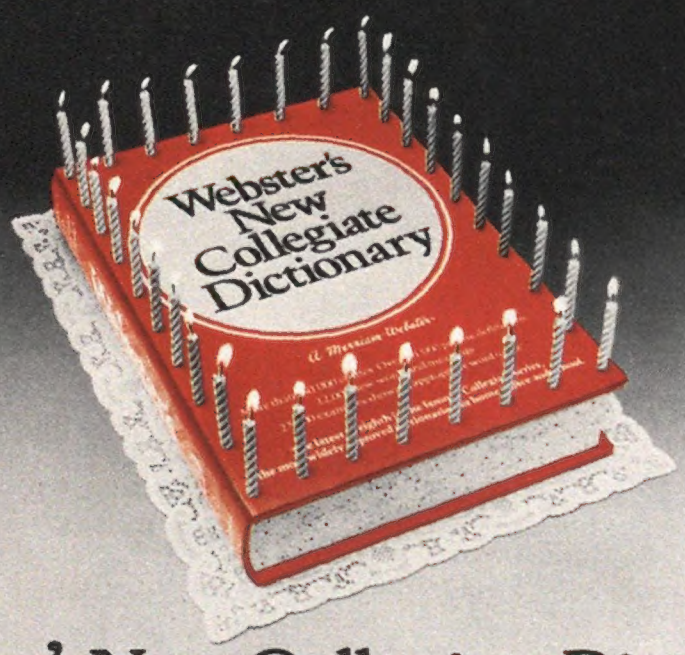

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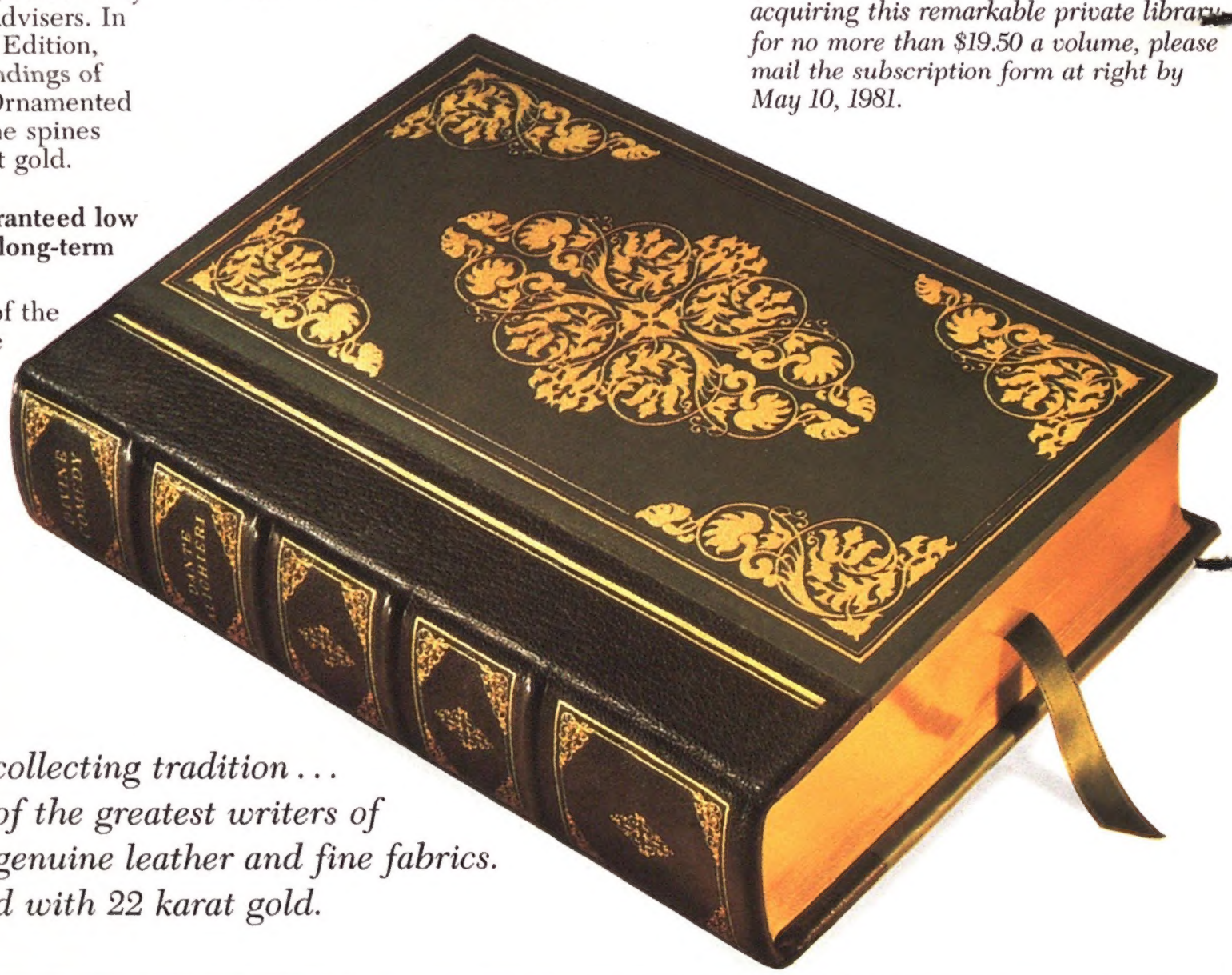

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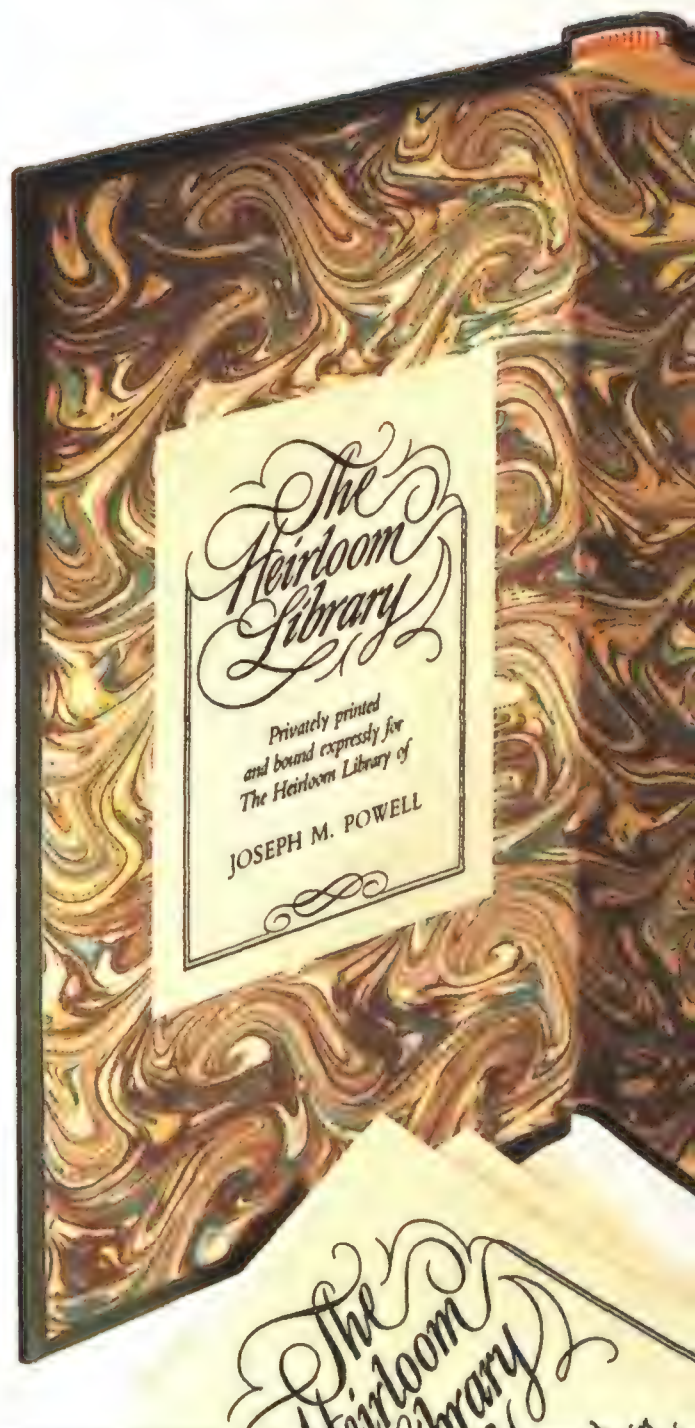
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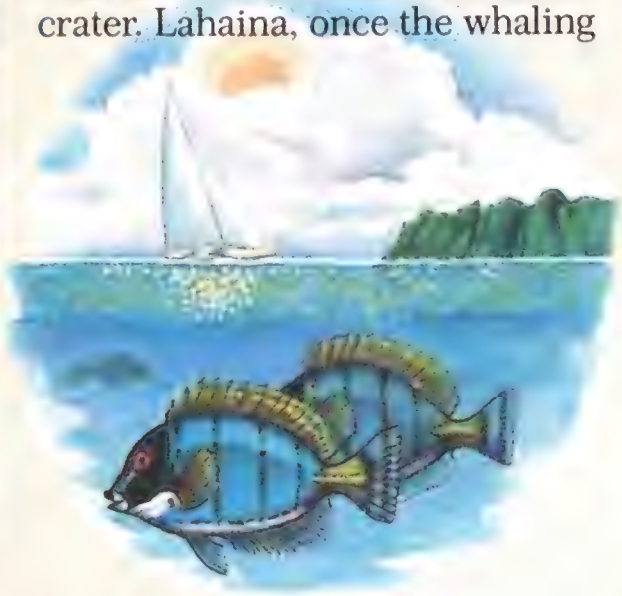
Molokai.

An island of tranquillity, from the emerald green cliffs guarding the northern shore to the camping paradise of Wailau Valley. There are more native Hawaiians per capita on Molokai than anywhere else on earth. Maybe that's why it's called The Friendly Island.

Maui.

The tropical splendor of Hana, royal resort of Hawaiian kings. Sunrise over awesome Haleakala crater. Lahaina, once the whaling capital of the world, now restored to the look of its 19th-century heyday. The famed beaches of Wailea and Kaanapali. They're just a few of the marvels of Maui.



Hawaii.

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Secretary Ripley's comments

The view from the castle

State of the Smithsonian:

From the Annual Report—Part 1

One of the most gratifying events of the past year was the conclusion of an agreement whereby our National Portrait Gallery and the Museum of Fine Arts in Boston will share the Gilbert Stuart portraits of George and Martha Washington, each museum displaying them three years at a time. Strangely enough, this concept of sharing unique works of art or history is still new, and little endorsed by the great art or historical museums. Pride of possession is too strong in the hearts of curators, acquisitors all. Yet it was a grand acquisitor himself, Thomas Hoving, the former director of the Metropolitan Museum of Art, whom I recall suggesting such a program, one with which I am heartily in accord. Solomon's choice, one might say. Nonsense! Sometimes works of unique importance should be shared, if not physically divided.

It is to be hoped that in the future more museums will feel this way. Just as we are fortunate to share the Washingtons, we are fortunate to be able to share our exhibitions. Our success here is with the Smithsonian Institution Traveling Exhibition Service (SITES), which I wrote about in the issue of November 1979. This is a far more effective service for us to provide than to accede to the oft-repeated plea that we manage entire museums in other states. SITES has now achieved the enviable position of being the largest and most diversified agency of its kind in the world. Up to 150 art, science and history exhibits have been circulated in one year to 680 institutions in the United States. These exhibitions reached more than five million visitors to museums, libraries, universities and other institutions whose programs would have been far less diversified and meaningful had it not been for the contributions of SITES.

In discussions of museum operations, a distinction is often made between research and exhibition—a distinction that is also enshrined in the language of federal budgets. The fact is that any good exhibition is necessarily both the product of research and a contribution to knowledge. In the case of art and science museums, where the evidence can be fully understood and appreciated only when it is physically before the viewer, exhibitions are in a real sense the most appropriate means of "publishing" the results of research. In recent years the Smithsonian's art and history museums have increasingly drawn upon their scholarly staffs to create exhibitions that will travel—some circulated by SITES, some by the museums themselves. To mention a few will indicate something of the range of our museums' contributions to the common enterprise of scholars and curators everywhere.

Cooper-Hewitt Museum, Smithsonian Institution

Frederick Church: *Niagara from Goat Island, Winter*

One such, "Western Views and Eastern Visions," a collection of photographs mostly taken by members of the U.S. Geological Survey during the second half of the 19th century (and for the most part never exhibited before), gave an unvarnished view of the grand spectacle that our early explorers encountered as they were mapping this country.

The Hirshhorn Museum's important retrospective, "Miró: Selected Paintings," was later seen at the Albright-Knox Art Gallery in Buffalo. Its exhibitions of works by the Colombian painter Fernando Botero (right) and the American Edwin Dickinson traveled to Corpus Christi and Louisville, respectively.

An exhibition of oil sketches by Frederick E. Church (p. 11) from the collection of the Cooper-Hewitt Museum was organized by an outside curator, traveled to eight cities under the auspices of SITES, and was finally shown at the Cooper-Hewitt last year.

"The Drawings of Morris Louis," mounted by our National Museum of American Art, was seen at the Fogg Art Museum at Harvard and is now in Israel.

Finally, as the result of a very happy and fruitful international collaboration between Dr. Otto Mayr of our National Museum of American History and the Bayerisches Nationalmuseum in Munich, the very important exhibition called "The Clockwork Universe: German Clocks and Automata 1550-1650" has been seen in both institutions.

In all these exhibits, the Collections Acquisition Fund provided by the Regents plays a significant role. This is part of our trust-funds budget allocated for the purpose. The possession of such funds is a new development for the Institution and makes possible—

Hirshhorn Museum and Sculpture Garden, Smithsonian Institution

Fernando Botero: *The Hunter*

sometimes with matching grants—the purchase of material formerly beyond the Smithsonian's reach. Thus the Hirshhorn Museum, in connection with the Miró retrospective mentioned earlier, was able to acquire the painting *Woman before an Eclipse with her Hair Disheveled by the Wind,* which was included in the exhibition. Additional examples are a collection of 12 Chinese calligraphy scrolls, exhibited so handsomely at the Freer Gallery of Art; the Gaston Lachaise sculpture *Standing Woman (Heroic Woman)* installed on Hirshhorn plaza; and of course the Stuart portraits.

Along with the purchases, the importance of some of our collections—such as gems and gemstones—increasingly attracts major gifts. We were also fortunate the past year in receiving gifts of modern art. From Vincent Melzac came an extremely important collection (partly purchased with the Collections Acquisition Fund, partly a gift from Melzac) of contemporary or recent paintings. They include examples of the so-called Washington Color School, as well as seminal works by Willem de Kooning, Kenneth Noland and Jules Olitski (left).

And so each year we have more things to share, not only with the millions of visitors who come to Washington, but also with people in their own communities and even abroad. That is as it should be.

S. Dillon Ripley

National Museum of American Art, Smithsonian Institution
Gift from Vincent Melzac Collection

Jules Olitski: *Cadmium Orange of Dr. Frankenstein*

Isn't it time to give a real tax break to savers?

On the average, Britons save 13% of their disposable income. West Germans save 15%. Japanese, 26%. But Americans save only 5.5%!

A major reason people in other nations save more is that they are given tax incentives by their governments.

The U.S. actually discourages savings, by taxing the interest that is earned.

Isn't it time Congress gave savers a real tax incentive? We think the annual tax-free limit on savings interest should be raised to $1,000 for individuals and $2,000 for joint tax returns.

This would encourage more savings, which would help stabilize the economy and bring inflation under control.

What do you think? Please fill out the ballot, and let us know. If the ballot has already been removed from this page, you can still vote at your nearby Savings and Loan Association.

If we all speak up, Washington will listen.

The Savings & Loan Foundation

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BALLOT

Question: Should the first $1,000-$2,000* of interest on your savings be tax-free?

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Letters to the Editor

Morgan Library illuminations

Dear Sir: Your article, "The private world of illuminations opens up its doors," by John Canaday, in the February issue, is excellent. It reminded me of certain items I have in a collection that I had not appreciated properly before.

In this day of modern printing and reproduction methods, one does not have to be a king or even rich to own and enjoy beautiful illuminations and works of art.

C. B. Berry
North Myrtle Beach, South Carolina

Mono Lake

Dear Sir: Daniel Jack Chasan's article, "Mono Lake vs. Los Angeles: a tug-of-war for precious water," makes the point that the declining water level of California's saline Mono Lake is a problem that can be settled by simply reducing Los Angeles' water supply.

This solution is exactly what has been proposed during the past two years in legislation and litigation aimed at confiscation of a licensed water right of three million Californians. Such a loss would result in burdening city residents with water rationing and higher costs.

When Los Angeles began development of $150 million worth of Mono area aqueduct hydroelectric facilities in the 1930s, it was at the encouragement of the federal government, which supported two Acts of Congress protecting Los Angeles' Mono water rights.

Recent research conducted at Mono Lake has found the increasing salinity of lake water will not have any impact on the billions of tiny brine shrimp, which

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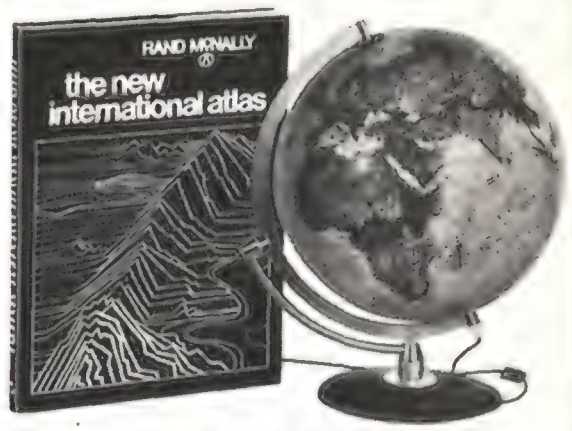

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provide food for the migratory birds, until well into the next century. Although there has been concern for gulls nesting on the lake islands, wildlife biologists have found the number is up to 40,000.
Steve Hinderer
Department of Water and Power
Los Angeles

Dear Sir: Mark Twain, who visited Mono Lake more than 100 years ago, was so fascinated with its qualities that he devoted an entire chapter of *Roughing It* to what he called the "lonely tenant of the loneliest spot on earth." In his characteristic fashion, he wrote:

"This water is not good for bruised places and abrasions of the skin. We had a valuable dog. He had raw places on him. He had more raw places on him than sound ones. He was the rawest dog I almost ever saw. He jumped overboard one day to get away from the flies. But it was bad judgment. In his condition, it would have been just as comfortable to jump into the fire. The alkali water nipped him in all the raw places simultaneously, and he struck out for the shore with considerable interest. He yelped and barked and howled as he went—and by the time he got to the shore there was no bark to him—for he had barked the bark all out of his inside, and the alkali water had cleaned the bark all off his outside, and he probably wished he had never embarked in any such enterprise."
Steve Roper
Berkeley, California

Dear Sir: The spectacle of Mono Lake is almost prehistoric in its eerie beauty. To think its value as a national treasure would be ignored because it does not have fishable water or because someone in Los Angeles insists on hosing the leaves off his driveway is very distressing to me.
Dana M. Shea
Denver, Colorado

Dear Sir: Having lived both in Los Angeles and Yosemite near Mono Lake, I have seen both sides of the water controversy and the problem that too many people living in a too-arid basin can cause. If only the amount of water wasted could be conserved and returned to Mono Lake, its demise might be postponed until a solution can be reached.
Ted W. Larremore, M.D.
Park City, Utah

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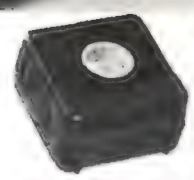

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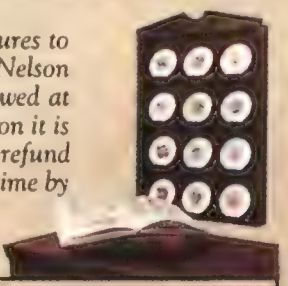

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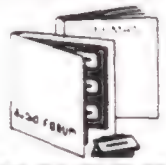

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Rostropovich

Dear Sir: I read with considerable interest and enjoyment Joseph McLellan's article on Maestro Rostropovich and the National Symphony Orchestra. However, I think it is regrettable that there was no mention of the tremendous contribution of Maestro Antal Dorati during the period prior to Rostropovich's arrival on the Washington scene. I doubt very much that Rostropovich would have considered coming here had it not been for the excellence achieved by the NSO under Dorati's leadership.
Edward D. W. Spingarn
Washington, D.C.

Dear Sir: In the photograph of Laurel Bennert on page 84, there is a sign on her music stand: "Horn players have terrific . . ." and then the crucial word is covered by a music book. Please! What is terrific that horn players have?
James Martin
Annville, Pennsylvania
Lips, Mr. Martin. Lips. Ed.

Bonding

Dear Sir: The article on bonding of mothers and babies by Hara Estroff Marano is noteworthy for its beautiful illustrations. Like many learned articles on mother-child relationships, it presents scientific data that have been available in all societies where mothering was learned from mothers and grandmothers.

Separating mothers from their babies is a barbaric "modern" phenomenon. Pre-World War II mothers typically were confined in hospitals for ten days and only allowed to see their babies at rigorously specified four-hour intervals. I was scolded vehemently by a nurse in 1937 for unwrapping my first baby to see for myself that he was as perfectly normal as the doctor had assured me.
Elena Klein
Redwood City, California

Dear Sir: There were some unfortunate implications in the article by Hara Marano on bonding. Attachment does not happen in the hospital. It is a process and a relationship that unfolds through many hours of interaction through the first year and beyond. Early hospital contact in no way guarantees a secure attachment relationship, nor has it any demonstrated re-

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lationship to prevention of child abuse. Numerous studies have failed to replicate Klaus and Kennell.

Most unfortunate is the implication that mothers and infants who do not have contact after birth (*e.g.*, because of premature birth or adoption) are at a serious disadvantage in forming attachment. Two forthcoming articles in *Developmental Psychology* debunk this myth. In the first, infants separated from their mothers at birth due to prematurity (for seven to 17 days) were found as likely to have secure attachments by the end of the first year as fullterm infants. In the second, the differences between early contact and routine hospital care were found, but disappeared by 10 days. Mother-infant pairs without early contact "caught up."

Early contact can be a very positive experience for parents. But it should not be confused with the process of attachment, a very complex matter.

L. Alan Sroufe, PhD, Associate Editor
Developmental Psychology
Minneapolis

Dear Sir: One area where bonding has been a failure (in the past, and to some extent in the present) is with the birth of a Down's-syndrome child. In most cases they are identified at birth, and some have been institutionalized immediately.

As the parents of a Down's-syndrome child, we came to the conclusion that it was very desirable to nurse the child in order to develop a sense of security and acceptance.

Our child has developed well and is now in "mainstreamed" classes in high school. She was evaluated at the University of Washington when a year old (and subsequently), and it is believed that her development may have encouraged the Infant Stimulation Program there which has proved to be so beneficial to Down's-syndrome children.

I believe that bonding to the father can also be significant.

Dwight M. Gowdey
Seattle

Dear Sir: Your article on infant bonding certainly is to be applauded, until the final picture. The caption implies a guarantee that infant bonding will result in a healthy, happy adolescent. There is many a crisis and event to modify the directions of growth between earliest infancy and adolescence. This one aspect

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Dorothy G. Siegel
Towson, Maryland

"Fleurage"

Dear Sir: I was delighted, warmed and inspired by the lovely art of Harry White, described in Celia Betsky's article, "His garden is his palette, petals are his paints." The world could benefit from the work of more artists like Mr. White, who seems to use his efforts to create higher levels of beauty from what in life is already beautiful.
Ron Moulton
Barre, Vermont

Phenomena, comment and notes

Dear Sir: John P. Wiley jr. refers to "the old saw about a tree falling in the forest when there is no one around to hear it," meaning there is no sound. And he adds that "quantum mechanics tells us there is no tree at all until someone sees it." This is, of course, the old philosophical question of the true nature of reality, whether it exists "out there" or in a percipient mind. I had thought the problem was solved in some verses circulating at Balliol College, Oxford, concerning a tree in one of its quads:

There was a young man who said, God
Now doesn't it seem to you odd
That this great chestnut tree
Simply ceases to be
When there's no one about in the quad?

It really is not at all odd,
I'm always about in the quad
And the great chestnut tree
Never ceases to be
In the mind of yours faithfully, God.

Louis Landa
Princeton, New Jersey

Dear Sir: There is no moment when the oak tree is fully perceived, and thus no moment when it truly "exists." Oak Treeness, if I may use such a term, is the sum of an infinite series of knowings—not only by human wanderers in the woods, but by the beetles that live in its bark, the birds that nest in its branches, the foxes who live between its roots.
Walter Murch
Bolinas, California

At Joe's Barber Shop . . .

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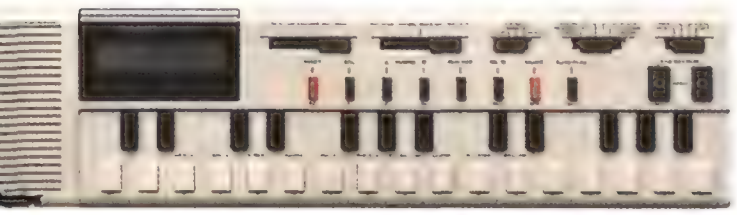

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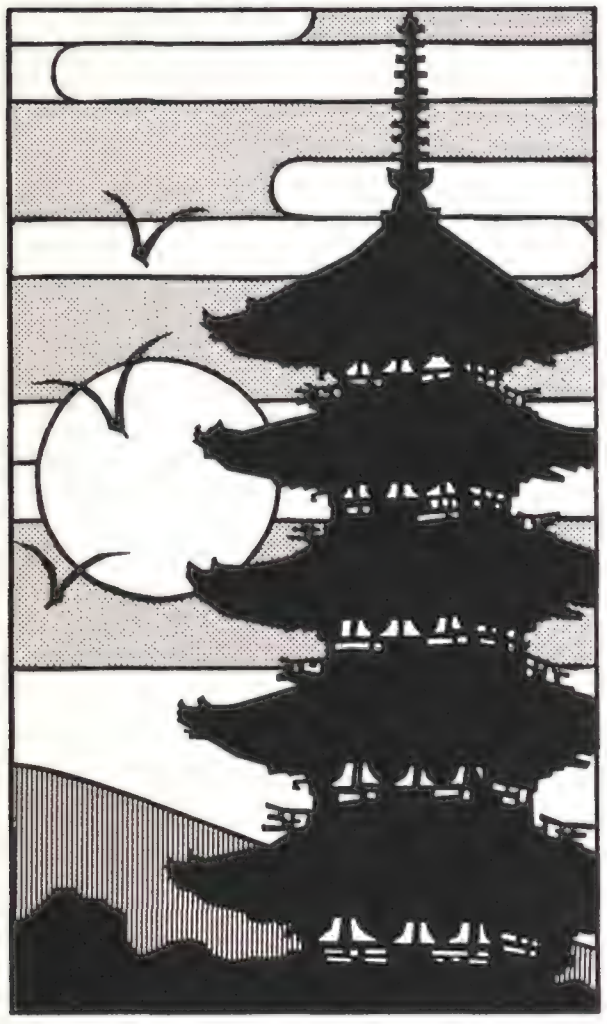

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ard Williams that the major difference between Joe's Barber Shop and any of the imaginatively named unisex clip joints he mentioned is a matter of about $10 per cut. "Joe" still makes do at about $5 in our area, but the others are $15 and up.
Evan P. Ininger
Buena Park, California

Dear Sir: "Shave and a haircut" reminds me of a song we learned in summer camp c. 1931. This was the last stanza:

Shave and a haircut, shampoo
Hit by an auto, Bellevue
When did it happen
Last night
How do you feel now?
All right
Clothes on a washline
Dry up
You said a mouthful
Shut up

Sheldon Wesson
Alexandria, Virginia

Dear Sir: So what's wrong with unisex? Barber Joe (or, if you prefer, M. Josef) seems to be doing something right.
Barbara Lippincott
New York City
Author Williams agrees: "Last time I walked by, the place was pretty busy. He had two sons and a daughter razor-cutting right alongside him. Talk about putting on heirs!" Ed.

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Around the Mall and beyond

That's a bee down there. *Triepeolus concavus*. It's not the way a bee generally looks, but it's exactly the way a bee really is. That's no photograph; it's a scientific drawing in carbon dust on frosted acetate.

A photograph would have presented the bee partly out of focus, where it slipped out of the depth of field of the lens. Messy hairs would have been in the way of the "forehead"—the clypeus. The drawing cleans those details up. It doesn't idealize the bee. It just shows the way a bee would look if it made the effort.

Triepeolus concavus was done for Dr. Paul D. Hurd jr. of the Smithsonian's Department of Entomology by Elaine R. (Snyder) Hodges, one of about ten scientific illustrators who, along with perhaps another ten contract artists, work in the Museum of Natural History. Elaine sacrificed a little time to show me around and explain how she and the others do one of the most precise and little-known jobs at the Institution. Drawings, and only drawings, can eliminate the dirt and hair that doesn't belong on a specimen and can show its features with a detail that would otherwise be impossible to achieve. In a very direct way they add to the sum of human knowledge.

Elaine took me through a pleasantly cluttered top-floor workroom, its walls festooned with pictures of ticks, beetles, wasps and other dubious creatures, its tables littered with the tools of the trade. To get that carbon dust, for example, Elaine sands down a carbon pencil (BB). The dust can be brushed smooth and built up to show gradual shading. A tiny piece of rolled chamois fitted into a brush handle smoothes further and takes away some of the darkness in case the picture needs to be lightened.

When meticulous lines are called for, the artist may use a very fine brush with most of the hairs singed off to produce a hard line. Of course, as Elaine points out, ordinary pencil sketches and pen and ink

Scientific drawing of *Triepeolus concavus*.

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drawings are used when they will do the job adequately. Another artist, Carolyn Gast, developed the idea of using watered-down ink as a base for carbon dust.

The artists use paper, or often a kind of board. A scratchboard, for example, is smooth to work on and gives you white when you scratch away the coating. Sometimes that's more effective than using white paint or white ink. There's also a coquilla board which is bumpy. It's no good with dust, but with other techniques it gives a stippled effect. Elaine says she doesn't use it.

The subjects for scientific illustration range from microscopic creatures to dinosaurs. Elaine showed me her rendition of the genitalia of a moth—a four-inch drawing of equipment that fits inside half a millimeter. Only artwork can expand such subjects and keep them clear and sharp in detail. I know disgracefully little about moths' genitalia, but the drawing looked fine.

Some scientific illustrators start as scientists and drift into this work; some start as illustrators. Elaine has done some portrait painting at home and has also been working toward a degree in entomology. Right now she's working on a book, a handbook of scientific illustration for the Guild of Natural Science Illustrators. She's also involved with the League of Women Voters.

She enjoys her job, and it took me a while to make her admit that disasters sometimes happen. I was sure they did. Elaine says that when she was new at the game she spent 11 days on an intricate carbon-dust drawing of a water beetle, then dropped a wet brush on it. Wet with white paint, that is. "I almost quit," she says. But Carolyn Gast produced some fingerprint dust for retouching and helped rescue it. Other catastrophes happen in such meticulous work. One artist was working on a wasp in clay and was aghast to find the clay melting under the lights. The wasp then collapsed into a puddle of mud. Microscope lenses are always in danger of tumbling off and smearing a specimen. Since one of the great reasons for these illustrations is to preserve the specimens, no one looks upon such possibilities very happily.

However, the scientists are apparently marvelous to work with. Once the staff did much careful work on a kind of crustacean called an ostracod. And when it was being put back in its jar it simply fell apart. The scientist reassured everyone that the creature was about to be dissected anyway. And another time a technician with an armful of slides showing mosquito genitalia collided with a scientist and dropped them all.

Oh well, back to the old drawing board.

The Egyptians are here. Last year the Belgians invaded us to share the celebration of 150 years of nationhood. Now the Egyptians are doing their stuff with not only the Smithsonian but also the National Academy of Sciences, the Phillips Collection, Meridian House International, the Middle East Institute, and a whole bunch of other sponsors who will certainly not forgive me for not mentioning them. Mrs. Anwar al-Sadat, Egypt's First Lady, has been taking part and has made so many friends that we're wondering if we should ask for *her* inaugural gown for our First Ladies Hall.

Our Smithsonian Resident Associates

MINDS OVER MATTER: A jetliner that tiptoes out of town

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helped sponsor this happy Egyptian invasion. Director Janet Solinger, who lined up all that Smithsonian involvement with the Belgians, has slipped right back into the same role with Egypt. Informal ambassador. Thanks largely to her, we have an exhibit of antiquities on display at the castle, sculptures at the Hirshhorn, ancient glass and a sculpture of a king wearing the white crown of Upper Egypt at the Freer, modern weavings at the Renwick, jewelry at the Museum of African Art, engravings of scientific expeditions from the time of Napoleon at the Museum of American History.

And there's more. The Associates are presenting Egyptian feature films. (Some of them are pretty good, apparently. They have titles like *The Water Carrier is Dead.*) There are also scholarly discussions and lectures and there's poetry reading (in Arabic), tours and workshops.

A lot of these events are going on this month, but many of the Egyptian activities are on the move to Los Angeles and Houston and, next month, to Memphis, namesake city of the ancient Egyptian capital. Memphis is putting on a Beale Street Music Festival for the Egyptians, and I think that's swell.

Music is going to be resounding all over the Smithsonian during the first weekend of May. It always does, of course, for this is the time when visiting high school bands put on impromptu concerts on the Mall and when the carousel (new and improved this year) rings out with "You've Got to See Mama Every Night or You Can't See Mama at All" and other selections, and a mood is set that lasts until the folk singers arrive to liven up the Festival of American Folklife. Last fall there was a blues singer ("I ain't had no lovin' since she be gone") and a Trinidad steel band and Vietnamese sounds and songs by Finns with white-blond hair.

But on the first weekend in May, Friday the first through Sunday the third, a group of enthusiasts called The Friends of Music at the Smithsonian are joining up with our own Division of Musical Instruments to put on a musical weekend. It's notable because it's the tenth one. Their program jumps around musically from a bagpipe welcome at the castle to one of those wonderful concerts by the Smithsonian Chamber Players in the Hall of Musical Instruments at the Museum of American History.

People sometimes express wonder that there isn't a museum of music at the Smithsonian. But really there is. The Division of Musical Instruments has its own concert hall on the third floor of the history museum and concerts are frequent and free. And if you haven't heard old music played on old instruments, you are missing a treat.

The May musical weekend isn't exactly free, since the Friends of Music people are putting it together as a fund raiser to keep up the work of restoring old instruments. But if you feel like getting rid of a little money (it's worthless anyway, these days) you get a weekend of sipping and munching and chatting and listening to our old instruments and also those of the Folger Shakespeare Library group, called the Folger Consort. And there's a champagne breakfast at the National Zoo, and all the museums open for you, bright with spring.

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Phenomena, comment and notes

A daily tax on our lives, gravity may be about to give up some secrets—even, maybe, some of its hold on us

Gravity has always struck me as the strongest natural force, especially when I'm working up a ladder or driving along a cliff. It's everywhere, it never stops, it's irresistible. Our homes are filled with furniture whose sole purpose is to hold things against gravity. A toddler spends its days in a one-on-one contest with gravity; the rest of us have learned to live with it, at least most of the time.

Of the other three so-called natural forces, only the electromagnetic makes an impression on us, sometimes as electric shock. The last two are known as the strong and the weak forces: the former is what holds protons together in the nucleus of an atom, and the latter is involved in radioactive decay. These operate only at the subatomic level and seem to affect us not at all.

For physicists the situation is quite different. They have been working with, "handling" you might say, the electromagnetic force for centuries and the strong and weak forces for decades. It is the gravitational force that remains elusive. (It seems strong to us because we happen to live on a body large enough to produce a palpable gravitational field. Gravity is so weak that it takes astronomical-size bodies to generate enough for us to feel.)

Einstein's theory explained how gravity acts at a distance (how, for example, the gravitational field of the sun crosses space to affect the Earth) by saying that a mas-

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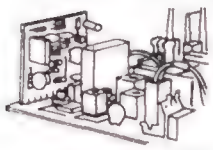

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sive object distorts the space around it: the Earth is affected by the sun because it is inside the area of distorted space. Extrapolations of the theory predict that changes in a massive object—the collapse of a star, say—would generate gravity waves: space-time curvatures traveling at the speed of light. And there's the challenge for a small band of dedicated physicists around the world to "see" gravity waves and complete the quartet.

Carlton M. Caves of CalTech recently summarized the situation for the scientists at the National Bureau of Standards here. "We hope to see gravity waves in ten years," he said. "Everybody in this field always says ten years. We've been saying that for ten years. But now ten years seems about right."

The time is right because laboratory instruments have evolved to an accuracy that can measure unimaginably small differences (SMITHSONIAN, April 1980). To "see" a gravity wave, instruments must be able to detect changes equal to one part in a sextillion (one followed by 21 zeroes).

In some laboratories the detector is a heavy metal bar, weighing several tons, wired to sense the minutest change. (The bar used in early experiments by Joseph Weber at the University of Maryland is now at the Smithsonian.) Other groups are using lasers and mirrors, and measure tiny changes in the distances between mirrors. They are now practicing with mirrors a few meters apart. With mirrors one kilometer apart, that one-in-a-sextillion accuracy should be obtainable. Still other experiments tracked the Voyager spacecraft, watching for glitches in its track. "The Cadillac of gravity-wave detectors," Caves said, "would be a million-kilometer baseline in space," something that could be built some time in the next century.

For me, the whole business of space and time being curved by the presence of a massive object requires the kind of willing suspension of disbelief they talk about in the theater. But if you can do it, other ideas do become graspable. One of the dramatic confirmations of Einstein's theories came in 1919, when Arthur Eddington found that light rays from stars are deflected as they pass close to the sun. It's difficult to imagine the unseen force of gravity acting on the weightless photons of light, but if you think of space being curved around the sun and the star-

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light simply following the curves, like a car on a banked track, then it seems to make sense.

More proof turned up last year with the discovery of an elliptical galaxy acting as a gravitational lens, splitting the image of a quasar behind it so that we saw two images and thought we were looking at two quasars. Frederic H. Chaffee jr., resident astronomer at the Smithsonian's Mount Hopkins Observatory in Arizona, narrates the evolving understanding of the first gravitational lens in the November *Scientific American*. Discovered only last March, the two quasars appeared so close together on photographs that their images blurred into one another. This was remarkable enough: only 1,500 quasars are known in the entire sky. Astronomers working in Arizona found their spectra were so similar as to be identical. The possibility that the twins, as they were called, were the first example of a binary quasar was reluctantly rejected for complicated reasons, and the scientists were left with the realization that the two images were the same quasar; they were seeing their first gravitational lens.

Photographs taken at the 13,600-foot-high Mauna Kea Observatory in Hawaii and with the 200-inch telescope on Mount Palomar in California revealed a fuzzy patch just north of the southern quasar image, an elliptical galaxy massive enough to deflect the quasar's light. The galaxy is just off the line of sight from Earth to the one real quasar. Light from the quasar streaming by the galaxy is bent toward the Earth.

As so often happens in astronomy, when a new phenomenon is discovered, more examples are quickly found. Even before the first gravitational lens was recognized for what it really was, a second was found. Ray J. Weymann of the University of Arizona and David W. Latham of the Harvard-Smithsonian Center for Astrophysics, heading up a group on the Multiple Mirror Telescope, found the first triple quasar, now presumed to be multiple images formed by a gravitational lens.

These cosmic optical illusions not only bolster Einstein's concept of gravitation; they also affect how we measure the universe today. We believe we live in an expanding universe in which all the distant galaxies are receding from us. We measure their speed of recession by cal-

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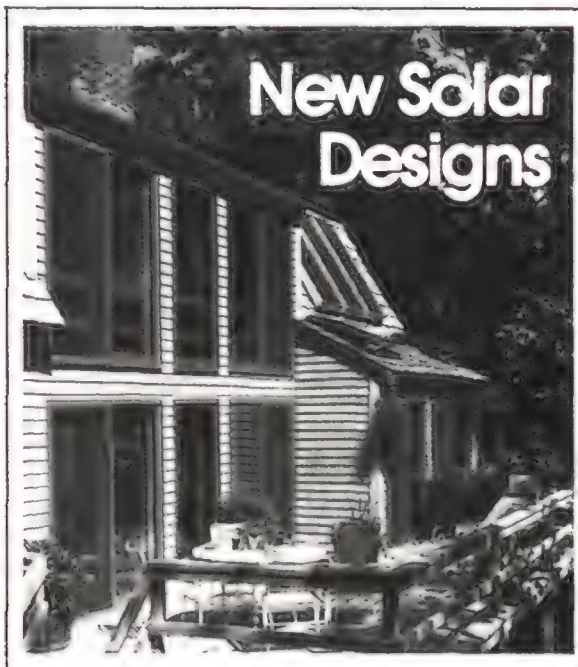

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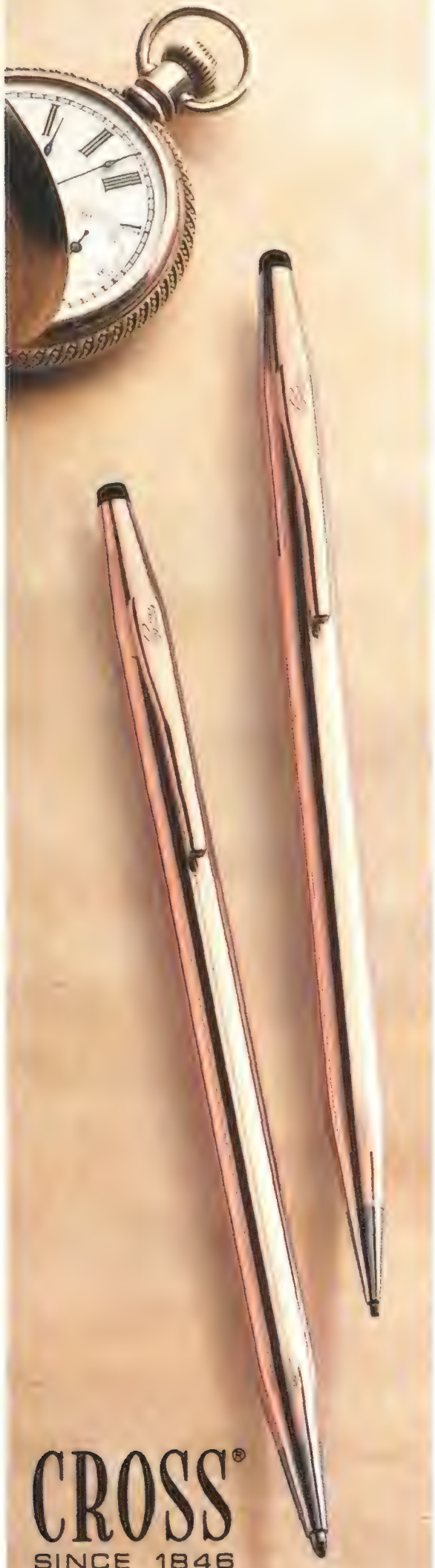

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culating how much the light coming from them is shifted toward the red end of the spectrum, the famous "red shift." The greater the shift, the faster the velocity and the farther away the object. But the red shift of most quasars is so extreme that they appear to be moving at substantial fractions of the speed of light and to be the most distant objects we know of. Some astronomers have questioned whether the red shift of quasars really means they are so far away. If they are, the argument goes, how can they be bright enough for us to see them?

But the gravitational lens discovered last year would work only if the quasar in question really is at the cosmological distance implied by its red shift. The riddle of the quasars will not go away.

While some scientists are looking for gravity waves and others for gravitational lenses, still others are looking for ways to lift things out of the Earth's own space curvature more cheaply than we do it now. The problem with a rocket, no matter how sophisticated, is that it spends most of its energy lifting its own fuel with it. The problem with an artillery shell (à la Jules Verne) is that the chemical energy of the best explosives limits muzzle velocities to only about a tenth of escape velocity.

But there may be a way to lift payloads into Earth orbit for a thousand times less than it costs with a rocket and even 50 times less than the space shuttle. This is the mass driver first proposed by Gerard O'Neill for use on the moon (SMITHSONIAN, February 1976). The device sends electromagnetic pulses down a track, accelerating a magnetically levitated object to the desired speed. O'Neill wanted a mass driver to fling bucketfuls of raw material from the surface of the moon to gravitationally stable points in space where huge colonies would be built.

But Henry Kolm and his students at MIT have been working on mass drivers that would work on the surface of the Earth, hurling payloads into space at the Earth's escape velocity of 25,000 miles per hour. Their first prototype, pictured below, accelerated a half-kilogram bucket to about 100 miles per hour. Now O'Neill and Kolm are collaborating on a second prototype, the Mass Driver II, designed to accelerate kilogram buckets up to about 770 miles per hour.

According to the December *Physics Today*, Kolm's group has calculated that freight could be launched into space in vehicles shaped like telephone poles. They would lose only three percent of their mass during a one-second transit of the atmosphere.

Gravity is a tax we always pay, whenever we lift a spoon to our mouths or try to escape the Earth. We'll never get into space as long as it costs a thousand dollars a pound to overcome the gravity that binds us to Earth. But if the mass driver can bring the cost down to a dollar a pound, we're a little closer.

—JOHN P. WILEY JR.

William R. Snow, left, and Kevin S. Fine, both then graduate students at MIT, pose with early model of mass launcher, an accelerator to overcome gravity.

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To assure the rarity, the Limited Edition version of these extraordinary Pendants is being restricted to just 2,500 pieces, worldwide. They are being issued exclusively through our organization, the Limited Editions Collectors Society of America, and are being offered to collectors of fine, handmade jewelry, and to those individuals who are seeking truly unique "Collector Jewelry" pieces for gift-giving.

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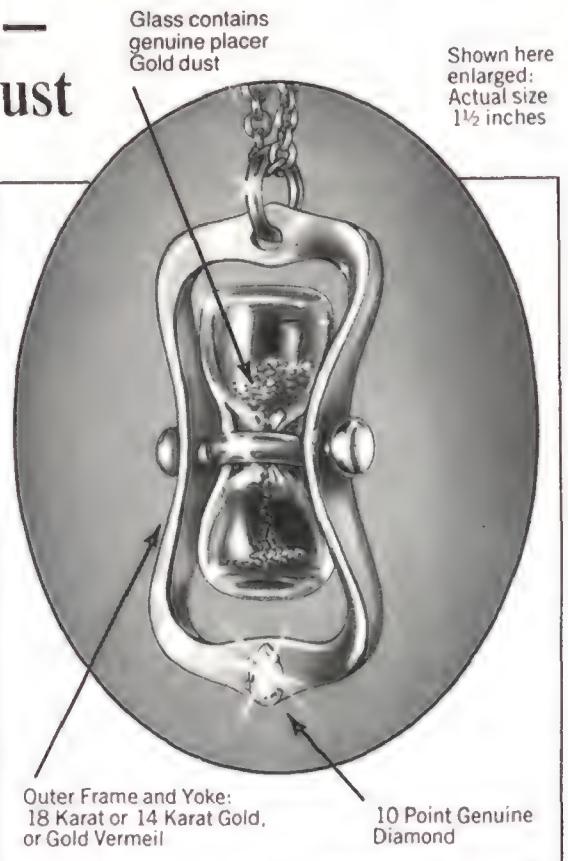
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The Collectors Society is a private organization, founded by a group of avid collectors, art lovers, and historians, including some who have distinguished themselves in the fields of Arts and Letters. In addition to creating and marketing unique and exclusive fine Collector Jewelry, the Society also issues authentic reproductions and replicas of historic artifacts, plus exclusive artworks and official Commemorative products. It has received a number of important awards for excellence and has been commissioned by a number of non-profit organizations, including the Winston Churchill Foundation, the Freedoms Foundation at Valley Forge, the Old North Church Museum, and the John F. Kennedy Library Fund, to create and market their official commemoratives to collectors.

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We again stress the fact that only 1,500 are being publicly offered. So, to avoid possible disappointment or needless delay, we strongly suggest that you mail your completed order coupon just as quickly as possible before the small Limited Edition is completely sold. There is also another reason for acting promptly. Due to the volatility of the gold market, we cannot guarantee the prices published here for any longer than thirty days.

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By Michael Kernan

The sumptuous, booming auction world–going, going, going very well indeed

Christie's and Sotheby Parke Bernet compete, fiercely but in a most gentlemanly manner, while old things go skyrocketing off the block

"Fifty . . . fifty . . . I have fifty to you, sir. . . ."

John L. Marion himself, the president of Sotheby Parke Bernet, Inc., is taking this auction. About 150 people sit, alert but cool, in the big room whose walls are covered with massively framed old oil paintings. On the stage rests a giant four-part turntable; an easel on the partition facing front holds a charming American primitive by Edward Hicks, a farmyard panorama. In the wings, two helpers remove the last shown painting, wrap it in blankets, set it on an elevator and put another in its place.

"Two-forty. . . ." The voice is sharper with excitement now. The bid has quadrupled in a matter of seconds. All around the room, aides watch the audience intently for signs of a new bidder. Suddenly a gray-haired man in a tweed jacket raises his index finger. It is the first time he has moved in this session. His wife cranes forward at his side.

"I have two-fifty. Two-fifty. Fair warning. . . ." Marion lifts his gavel hand.

But someone across the room nods. Then another bidder lifts a hand.

"Two-seventy. Are we finished?" Marion glances at the previous bidder, who smiles, shakes his head.

Bang goes the gavel. The Hicks has just sold for $270,000. The whole transaction takes 70 seconds.

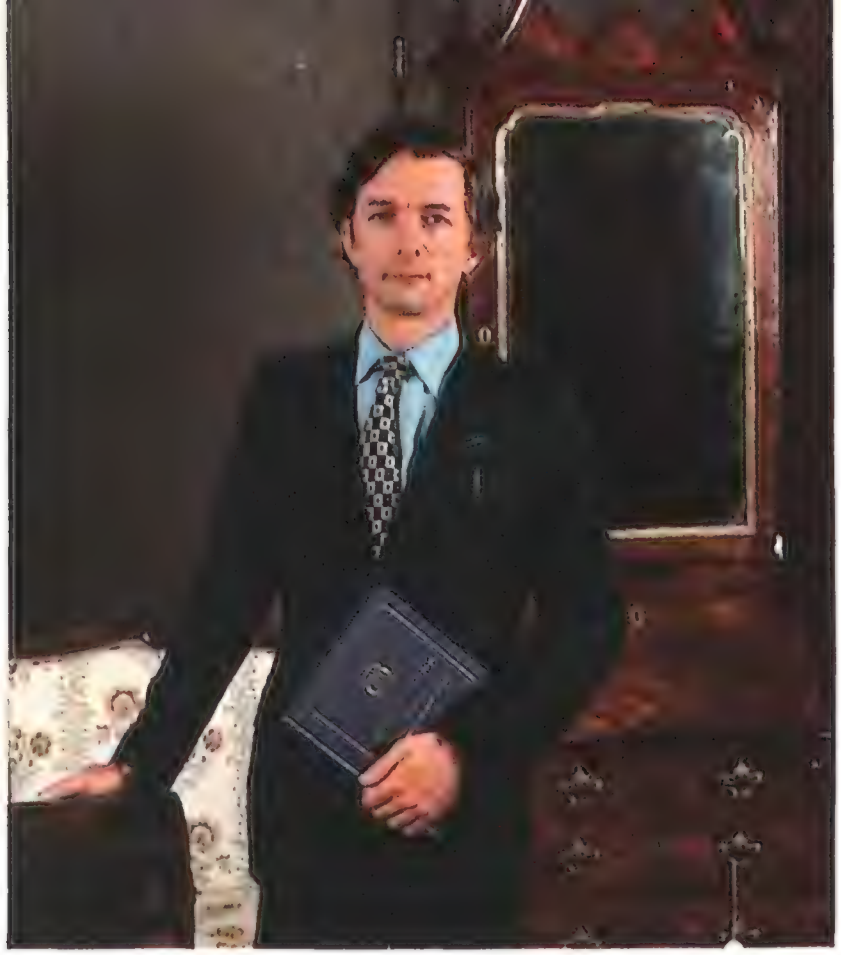
Aided by a steadily increasing awareness of art and artifacts as investments, the auction has come of age in America. Two venerable English firms, Sotheby's and Christie's, have brought the auction market into its own here, as it has been for centuries in Europe. "America has finally accepted the auction market as the best way to exchange items with no price tag on them," says Edward Lee Cave, chairman of Sotheby's onrushing real estate division. "Today, you can move in and out of the art market even faster than you can in real estate."

The rival firms love to quote figures: last season, the two of them netted well over $700 million in worldwide operations. In October 1979, in less than four minutes, Sotheby's sold Frederick Church's lost-and-found masterpiece, *The Icebergs (The North)*, for $2.5 million. That was more than double the previous record for any American work of art and the third highest bid at the time for any painting in the world, behind a Velázquez and a Titian.

Last season Sotheby's netted nearly $250 million in North American auction sales. (It also sold $80 million in North American and Caribbean property alone—after only four years in the real estate business.) But

G. Raymond Perman and E. Charles Beyer, Christie's men, confer at Fawick Collection auction in Cleveland.

Color photographs by John McGrail



David Bathurst, president of Christie's New York, with George I bureau-bookcase that sold for $250,000.

then, Sotheby's has had an auction presence here for 16 years. Christie's, which opened a U.S. auction room only in 1977, more than doubled its overall 1978 sales here in the following season for a net of $113 million. The 1980 turnover passed $128 million.

It was Christie's that sold that world-record Velázquez in 1970 for $5.5 million. It has since been outdistanced by Turner's *Juliet and Her Nurse*, sold in May 1980 by Sotheby's for $6.4 million. Christie's New York staff is about 250 compared to Sotheby's 750 (not including real estate staff); in London the firms are closer in size, though Sotheby's is still the bigger.

The Sotheby's people love to tell about their "lawn sale" to end all lawn sales at Pokety Farms, the estate of the late Edgar and Bernice Chrysler Garbisch, on Maryland's Eastern Shore, also last May (p. 47). There, $3.9 million worth of American furniture and decorations were sold, setting new records for both on-premises auctions in America and Americana. Items at that fabulous four-day event ranged from a $250,000 Chippendale desk (another new record, for American furniture) to an old Dodge pickup that went for $700.

Earlier that month, French paintings (including a $3-million Picasso) and furniture auctioned from the couple's suite at the Carlyle Hotel in New York sold for nearly $16.2 million. The combined auction total of $20.1 million set the record for any single-owner collection in America.

It is a very special little world, Cave points out. "Our people live well," he says. "You think Middleburg, Virginia, is in the middle of nowhere? Not at all. It's next door to Dulles airport, which means it's next door to Europe."

Mr. Kernan, a Washington Post *reporter, wrote on Dr. Lawrence Angel, a Smithsonian curator of physical anthropology, in the February 1977 issue.*

In art, too, the auction market is pyramidal, rarefied at the top. "How many people are there who will spend, say, $400,000 on a Jasper Johns?" asks Marion. "Just before the big Turner sale I wrote ten names on a slip of paper. Of those ten, nine were among the top bidders."

Marion believes the auction boom started here in earnest in the mid-Seventies, when the stock market lost its glamour for many investors and inflation began eating away at conventional investments. "The Europeans have known for centuries how well antiques hold their value. You're dealing with a limited supply, remember. How many cabinetmakers were there in 18th-century America? Maybe a half-dozen really good ones. In 1961 you could get a fine early American bureau for $16,000. Today the same bureau would fetch ten to 20 times as much. What we're talking about here is the preservation of wealth rather than simply making money."

Though the auction is as old as war (from the division of the spoils), it was the Romans who made a business out of it and the Dutch of 17th-century Amsterdam who enacted laws to control it. By the time Samuel Baker, a London bookseller, started his first auction sale in 1744, the techniques and customs were well-established. Baker thrived for years, selling books from the libraries of the great—including Napoleon's from St. Helena—and soon after his death in 1778 his nephew, John Sotheby, became a partner in the firm.

Sotheby's today has branches in some 50 cities around the world, including 13 in North America alone, from Toronto to Palm Beach. (There's a Sothe-

John Marion, president of Sotheby Parke Bernet, Inc., surveys costly collection of Tiffany Favrile glass.

by's office in Washington, D.C., and also, now, Peter McCoy. He put aside his gavel as president of SPB Los Angeles to join the Reagan campaign and is now Deputy Assistant to the President and chief of staff for Mrs. Reagan.)

Opening the New York office in 1954, the company expanded a decade later by buying out Parke-Bernet (the "t" is pronounced) at 980 Madison Avenue, America's largest fine-arts auction house, which itself dated back to 1883. Last fall, Sotheby's opened a block-long, four-story auction facility at York Avenue and 72d Street, which specializes in the decorative arts. Later this month, a new auction gallery, devoted exclusively to the sale of books, stamps and coins, opens on 84th Street. As in the past, the main Madison Avenue building continues to handle fine arts and jewelry sales.

James Christie opened his place in 1766 in Pall Mall, next door to his friend Thomas Gainsborough (who did his portrait). At the time there were at least 60 other auction houses in London, but no National Gallery or Royal Academy, the auction house being in effect the first public gallery. Christie prospered, working from a podium built for him by Chippendale (a reproduction is still in use here and abroad), selling everything from "72 loads of truly excellent meadow hay" to a coffin offered by a countryman unexpectedly recovered from what was thought to be a grave illness. One of Christie's most celebrated coups was the sale of Madame du Barry's jewelry, brought to him secretly from France in 1793. He also sold Catherine the Great many of the Old Masters which formed the basis of the dizzying Hermitage collection in Russia.

Bidders pay attention at Sotheby's sale of Garbisch collection, which brought $16.2 million.

Raised finger could mean $100,000 at Christie's sale, in March 1980, of paintings owned by Henry Ford II.

In New York Ford's collection was quickly sold to bidders for a very grand total of $18.3 million.

The booming world of auctions

Browsing model casts a speculative eye at one of the high-fashion dresses auctioned at Christie's East.

The enduring rivalry between Sotheby's and Christie's, aside from the cash involved, is more than anything an expression of different styles. David Bathurst, the witty, Oxford-educated president of Christie's, likes to think of his company as the Rolls-Royce of auctioneers, and Sotheby's as the General Motors.

"It's a matter of quality and quantity," he says. "The new Sotheby's building on York Avenue is a soulless place. We try to cater to the individual, and I think it's significant that we're on Park Avenue, closer to the residential area, rather than on York. It means we're closer to a very good crowd. They can walk here from their homes. And we get the biggest prices selling directly to the final buyer, rather than to a dealer."

Proportionately, Christie's does record a higher profit than Sotheby's. Christie's auctions are mostly held in the old Delmonico's at Park and 59th, with its fine, scratched old parquet floors, gracious ballroom, high-ceilinged rooms converted neatly into skylighted offices and carrels. It has another smaller building—Christie's East—on 67th Street.

The quiet approach

Christie's is low-key. It has many European employees. Its auctions seem quieter: there is no electronic currency converter (a Sotheby's innovation), instantly translating all bids into pounds, marks, yen, francs and what have you. There is no revolving turntable. Each item is wrestled onstage by smocked helpers or simply pointed to on the cluttered walls of the bidding room. Even the auctioneer's patter is more discreet, more like the English style, in which the auctioneer just waits for the bids and accepts them rather than asking for them.

Sotheby's does seem to be constantly pressing forward into new areas. Its venture into real estate has been the most spectacular success of recent years. It recently sold Hollywood director Dino De Laurentiis' 35-room mansion and ten-acre Beverly Hills estate—"The Knoll"—to singer-songwriter Kenny Rogers for $14.5 million. It was a record for a U.S. residential property.

Christie's has been experimenting a bit itself, notably with trying to get a permit for its first American sale of fine old wines, a commonplace for generations in England but somewhat gingerly received by New York liquor dealers, who claimed a foul. But it was pointed out that not many conventional liquor stores commonly sell 50-year-old port a bottle at a time.

Christie's and Sotheby's—it's a question of tone, perhaps. Christie's is full of bright young women from Eastern colleges: every art history major in the country seems to have landed there. They can be heard speaking French or German or Russian any time of

A trio of Sotheby experts who, between them, know what should be known, and isn't always, about infinite styles and qualities of china and silver. Here they are evaluating a private estate in Toledo.

day as customers trudge up to the counter with their offerings in paper bags: "No, I'm sorry, that's not a Paul Revere saltcellar . . . no, it's not a Rubens . . . no, it's not Lalique, it's plastic. . . ."

At Sotheby's, one is more aware of the dapper young men in dark blue suits, men whose eyes look too old for their faces. It is a business, after all.

Everything starts with an appraisal. It may be offered free at the counter, it may be solicited by a customer or trust officer who brings the expert to his home or the bank vault. Sotheby's holds Heirloom Discovery Days (p. 46) all over the country, in conjunction with local museums, to which people bring old spoons and plates, dog-eared books, splotched old prints and paintings, for instant judgment. Christie's has a similar service.

One upstate New York man brought in a $6 dish. It was Ming, he was told, worth some $50,000. At auction it brought $76,000. Someone else found a dusty bronze in a hatbox in Pittsburgh; today it's in the Metropolitan (it was identified as an Italian Renaissance sculpture). A Chevy Chase, Maryland, family, trying to get

Prospective bidders examine wares before a Christie's sale of impressive antique Japanese vases.

At Sotheby's Heirloom Discovery Day in Lancaster, Pennsylvania, a man brings in a Lincoln portrait.

rid of a carton of china in the garage, learned it was T'ang. Sotheby's sold half of it for a half-million.

It doesn't happen every day, of course. For every eye-popping discovery there are hundreds of disappointments. Though the market in just about everything, from Victorian furniture to pocket watches, has been rising crazily in the last few years, some things actually have lost ground. Lalique glass, for instance, all the rage a few seasons ago, subsequently resurrected from attics everywhere, seems to be leveling in price, as are Tiffany lamps. Silver was down in June, came back up by August. As a rule, portraits are not doing well at all.

It is the appraiser who keeps this shifting market from chaos, rather the way a stock specialist maintains price continuity.

"You want to sell a porcelain dish?" asks Sotheby's Cave. "We have specialists in Japanese porcelain, Chinese porcelain, 19th-century porcelain, Chinese Export, very late and very early European. We have six people just doing porcelain. After all, you can sell one piece for a half-million. You can't be wrong in this day and age."

One time E. Charles Beyer, Christie's resident expert on European furniture, was shown a "19th-century jewel cabinet." Examining it, he removed porcelain plaques and found Sèvres factory price stickers on their backs.

"I knew that Sèvres had only put on the stickers in the 18th century, so it was much older than it looked. The style was much like mid-19th century, but instead of selling for $8,000 it went for nearly $100,000."

This arcane art is just a matter of looking, says Henry M. Wyndham, Christie's man for 19th-century European paintings, a product of Eton with a rich "U" accent. He spent three years at Christie's London before coming to New York in 1977. He is one of a dozen English staffers at Christie's. "It's not merely academic," he says.

"You get a feel for it," explains John Marion, one of the best auctioneers in the business. "You find out if there's great enthusiasm for some particular line of things, or if it's just two stubborn people pushing the price up."

(Some auctioneers get louder as the bid goes up. One woman, auctioning some master drawings, spoke softer as the price rose and rose; it was almost conspiratorial. At a small auction peopled by dealers well-known to the seller, the atmosphere was unusually casual: "Five thousand to you, Bob.")

Appraisers aren't too concerned over fakes. Most antiques are simply not worth faking with the skill needed to fool one of these experts. True, certain painters are easy to forge—Modigliani and Corot are two—and for that very reason, works attributed to those painters are treated much more skeptically and get special study and chemical analysis. "Most fakes are pretty bad," remarks Beyer. "They should be obvious to us."

A one-day sellout at $3.4 million

An appraiser loves to see a great auction, a sale with "no hype in it," as Beyer says, "all good stuff, bought from the best dealers by the owner, bought with taste and an unerring eye." One such sale of English furniture, held last January, had him rubbing his hands. It was all from a single collection, that of Marjorie Wiggin Prescott, and in excellent condition: 360 objects, a wide range of items. Two months before it opened several European dealers had booked on the Concorde to attend it. The one-day sale was a sellout, and brought $3.4 million.

Once the appraisal is settled, the owner comes to an agreement on his reserve price (at Christie's it's generally around 75 percent of the low estimate as published in the catalog; at Sotheby's, it's generally about two-thirds). Bidding will start at about a third of the low estimate. The private reserve, by the way, is a sore point with dealers, who feel it is an artificial form of price support. Auction people reply that were it not for the secret reserve, dealers would band together to buy things far below fair value and later settle among themselves.

To make a dangerous generalization, one could say that auction houses tend to favor the seller and dealers the buyer; or, that auction houses are like wholesalers

and dealers can roughly be likened to retailers.

Another controversy rages around the buyer's premium of ten percent (in addition to the seller's premium of ten percent), instituted by Christie's in London in 1975 and in America two years later. Sotheby's followed suit here and abroad soon after. The policy is currently under attack by a dealers' association lawsuit in England.

"Frankly, we and the dealers need each other," says Bathurst. "We're a source of supply for them. We average $4,000 per sale in major auctions and much less, about $400, in the lesser things at Christie's East. We sell more than 80,000 lots a year. But we never buy things ourselves. Sotheby's does. It's a dangerous area, encroaching on the dealer's patch. In any case, it's a seller's market today, with buyers appearing on their own. The competition is to find sellers. One has to remember, though, that's not always the case."

Sotheby's executives reply that they only rarely buy items, that usually it is a matter of being stuck with something by a defaulting customer.

Richard Howard

New York antique dealers do some very careful preauction appraising of Pokety estate sale.

A time for examining the goods

Some five days before the auction, items are put on display. This, for many buffs, is the best part of all, for they can walk right up to a painting or rare object and study it at close range. They have been known to pull loose the underpinnings of a stuffed chair to check its joinery. They bring along infrared lamps to inspect paintings and needles to probe hairline cracks in porcelain.

Wandering through a viewing room, one is apt to see a portly, graying man in a three-piece suit down on the floor in knee-chest position examining the foot of a Chippendale chair with a penlight. In the jewelry room, two Hasidic Jews in black fedoras and sidecurls study a jade pendant under their loupes.

Catalogs are usually available three to four weeks ahead of an auction. They range, generally, from $5 to $15, and it is possible to subscribe to all the scores of those put out by a major house in a year. Christie's has catalogs in about 60 categories. Sotheby's has 80,000 catalog customers in 72 countries. Low and high estimates are given for each item, and its condition is usually described.

The choreography of an auction is a matter of some debate. Some auctioneers start right off with the star of the show; others like to work up to it gradually, though the last item is usually some trifle, a lagniappe to quiet the blood. "Lotting" a sale, with lots going one a minute, is more an art than a science. The auctioneer will know most dealers and other regulars. At a sale where customers may not be familiar, say at an on-site estate auction or at Christie's East, people identify themselves with numbered paddles which they hold up to bid.

The first bid is a clear gesture, and after that a mere nod will do, for auctioneer and spotters will be watching. Bids can be made by mail, which are announced at the appropriate time by the auctioneer. Or they can be phoned in. It is not unusual to have two bidders, on the phone from San Francisco and Boston, dueling across a salesroom in New York, with the assistants who are answering the phones giving the nod for them.

Some wealthy buyers go to great lengths to hide their identities. Once G. Raymond Perman, an English-born Christie's executive who came up from the mail room, was told by one bidder that when he held his glasses in his hand he was bidding, but that when he wore his glasses, he was finished. A second bidder sidled up later and made exactly the opposite arrangement with him.

"I tell you, it was something, trying to remember which one was supposed to be bidding when he had his glasses on," Perman laughs. "Another time, a woman in the front row suddenly swept her arm up like a semaphore and swung her wrist down to look at her watch. I really did a double take that time. I said, 'Madame, that is a rather expensive way to tell the time.' "

So much for the old gag about scratching your nose at an auction and winding up the owner of a grand piano. On the rare occasions when something like that does happen, the item is simply rebid.

Individual bidders are only part of the auction world. Museums and other institutions show growing interest. Someone gives Amherst College his pewter

Seated beside a purchase, buyer at Christie's sale is equipped with numbered paddle for signaling bids.

collection; Amherst sells it at auction; the college gets the money tax-free; the donor gets a tax write-off.

"Museums are getting more sophisticated about buying and selling," says one Sotheby's executive. "They're no longer some sort of black hole for art works, though the rarest things may be taken off the market by them for good. But that's a small part of it. Museums often sell off things when they need money or have duplicates. They also advise collectors what to buy so the collectors later on can donate the art to the museum."

The very scale of these auction houses is hard to grasp. Take the new York Avenue building, where Sotheby's concentrates its decorative arts department, including things that are really less antiques than simply old, like nostalgia items. A quick tour of the main rooms takes one past huge displays of Islamic art, Japanese, Indian, African objects, pre-Columbian sculptures (very hot these days), rugs and carpets, all of what someone called "the East-of-Suez stuff." There are wooden Indians, vases, Masai shields, Oriental dolls, candelabra, early Americana, glassware—all stacked so thickly that one negotiates the room via a narrow path.

Jerry E. Patterson, Sotheby's senior vice president in charge of books, stamps and coins, will run the new gallery on 84th Street. He is a bit of a rarity himself, having worked for both Sotheby's and Christie's, the latter as its American agent before it opened a full branch here. "Sotheby's is very open to ideas," he says. "We had our first photo auction in 1967, the Will Weissberg collection. Brought $17,865, and we thought that was fantastic. Last year we cleared $2.3 million in photographs."

Special security precautions are needed in this branch, whose contents are so portable and intrinsically valuable. The stamp business alone is incredible: at a recent sale, new records—of $210,000 and then $230,000—were set for American stamps within a few minutes of each other. Each sale took 15 seconds. The auction had to be stopped at that point to quiet the four TV crews and nearly 20 reporters on the scene. There are, after all, 30 million stamp collectors in this country.

Book auctions are somewhat quieter, but the market is very steady, values solid. Yet even here, lightning can strike. In 1926 T. E. Lawrence checked the just-completed manuscript of *Seven Pillars of Wisdom* at Victoria Station. When he came back to get it, someone had taken it. What if that were to turn up in some old trunk one of these days? The manuscript of *Moby Dick* is missing too. What would it bring today? Patterson shrugs and smiles.

All auction people are optimists and boosters, but none more than Sotheby's boss, John Marion. "We're trying to bring this business roaring into the 21st century," he says. "It's not Victorian anymore. The day isn't far off when computers will handle it all, manage collections, catalog stuff, estimate values. Already we're using video techniques, modern publicity methods. We're even conducting auctions by satellite, so buyers all over the world can be on the scene."

Eyebrows have been raised over the Sotheby's arrangement with Citibank, whereby bank customers can go to one Citibank branch, situated (but only "coincidentally," the auction house says), in the same building as Sotheby's corporate headquarters, for advice on buying art for investment. Might this be a conflict of interest?

"Not at all," retorts Marion. "We give the best advice we know, and maybe we'll tell them to go elsewhere, but in any case the customers make their own decision. They're hardheaded people, after all. No, we see that market as a slow-growth thing. What we're doing there is simply building some solid new collectors of the future."

His interest in the future is only natural: every old object has a past, but an antique is an old object with a future.

Armed guard, looking like a samurai himself, watches over splendid 19th-century suit of Japanese armor.

By Janet L. Hopson

Miners are reaching for metal riches on the ocean's floor

Nodules on the seabed offer an abundance of minerals, but it may be a long time before we know who has rights to mine them

"We're the folks leaving St. Louis in covered wagons," said Bill Siapno as the Research Vessel *Prospector* glided away from a San Diego pier, headed for a two-day "shakedown" cruise. Industrial oceanography, Siapno was saying, is all trial, all new. "And deep ocean mining—the last great gold rush—is even newer." Siapno, a trim 54-year-old geologist, had a toothpick in the corner of his mouth. "Ten years ago, we were comic relief at all the mining congresses. People laughed at the idea of bringing up minerals from water 15,000 feet deep. Well, we proved we could. We may never actually get to, considering world politics. But at least the other miners stopped laughing a long time ago."

Siapno is the head of marine sciences for Deepsea Ventures, a firm whose goal is to retrieve three million tons a year of mysterious blackish mineral lumps called "manganese nodules" from the abyssal plains of the Pacific Ocean. These sooty, crumbly, irregularly shaped lumps contain more than 40 elements. Four of these, manganese, copper, nickel and cobalt, are imported by the United States at a cost of some $2 billion a year. The growing specter of mineral shortages and cartels, as well as the promise of corporate profits, spurred Deepsea Ventures and a few competitors to tackle the difficult task of lifting nodules through three vertical miles of cold, dark water.

Like its major competitors, Deepsea Ventures is backed by a consortium of oil, mining and metal-manufacturing companies. One might expect such a high-level race for the ocean's wealth to be lavishly funded and equipped with sleek ships, large technical crews and state-of-the-art electronics. Not so. Siapno calls their working ship, R/V *Prospector*, "the old bucket," and another crew member refers to her as "700 tons of nostalgia."

The 152-foot *Prospector*, built in 1938, carried passengers between islands in the Saint Lawrence River. After its retirement, it was refurbished as a floating prospector of manganese nodules. Although equipped with sophisticated navigational and mapping instruments, the bridge still holds reminders of its past life —a telegraph box with a slot for an alcohol lamp and a brass binnacle once illuminated by an oil lamp.

Because of legal and political uncertainties that surround mining the high seas, the ship was out of commission for most of 1980. With the signing of a U.S. ocean-mining law last June, however, the ship and its crew resumed prospecting.

"A ten-year research and development venture that has yet to turn a profit," Siapno said in his native Virginia drawl, "must learn to live on a shoestring—and a lot of creativity." Siapno is no stranger to enterprises that require an inventive approach. He has been the "forever pioneer," as he puts it, always on the leading edge of technology. He was an aerial uranium prospector in the 1950s. He took part in the nuclear bomb tests in Nevada. He later studied Martian and lunar geology for the space program, and then, in 1966, joined the first efforts to mine manganese nodules.

Curiosities in the British Museum

The nodules themselves were actually discovered much earlier—at the same time, in fact, that oceanography itself began, with the historic voyage of HMS *Challenger*. This three-masted corvette left England in 1872 on a 79,000-mile journey to study the world's oceans. The scientific crew recorded the contents of numerous dredges of the ocean bottom. The log listed not only coral fragments, mollusks, algae and sponges, but—in the deep waters of several oceans—"concretionary lumps." The reddish-brown to black lumps ranged in size from cinders to charred potatoes, and were made of metal oxides. Some people thought they were pieces of meteorites. Considered curiosities, they were displayed in the British Museum.

After World War II, underwater cameras were improved and it soon became clear that millions of square miles of ocean floor are paved with these black

Nodules that formed over millions of years contain valuable quantities of manganese, copper, cobalt.

Photographs by Christopher Springmann

Bill Siapno, head of marine sciences at Deepsea Ventures, takes time off during shakedown cruise.

cobblestones. Some are found in water as shallow as 100 feet, and a few even occur in freshwater lakes. Most, however, lie nestled in the soft sedimentary ooze 10,000 to 20,000 feet beneath the ocean surface.

The origin of manganese nodules is as mysterious as the remote world in which they silently form. They have been called the "rust" of the ocean and compared to rock candy, crystallizing from a saturated solution. Every cubic mile of ocean water contains almost 165 million tons of dissolved minerals, from table salt to gold. The precipitated nodules on the Pacific's deep seabed alone are estimated to weigh more than a trillion tons. Mineral content varies. In some areas, they contain 30 percent manganese, 1.25 percent nickel, 1 percent copper and 0.25 percent cobalt. This represents a veritable motherlode of metals, many times higher than the usual concentrations in land ores, and considerably larger than the remaining tonnage of land reserves.

Although the content of nodules can be determined, there is still no universally accepted theory of how they form or where the metals in them come from. Various theories have the minerals originating from biological material in the sediment, carried into the oceans by rivers, or "belched" into the sea by spreading of volcanic sea floors. Most scientists believe the metals diffuse through the water, then precipitate around some nucleus: a tiny fish bone, a shark's tooth, a bit of clay. The accumulation process is not understood, either; current theories invoke electrical charges or the digestion of tiny marine organisms, to mention just two. What is known is that the nodules accrete in layers like tree rings, at incredibly slow rates —a few millimeters per million years. Occasionally, deposits do accumulate more rapidly; manganese crusts have been found on navy brass, artillery shells, even spark plugs.

Staking out their claims

Despite the imperceptibly slow growth of individual nodules, their numbers are so vast that an estimated 16 million tons accumulate each year, a simple fact with a staggering significance: the world's oceans are a metal farm, producing a resource of vital importance to industrialized countries.

With such impressive stakes, international consortia formed during the 1970s to develop an ocean-mining industry. Oceanographic surveys so far show that the heaviest concentrations of nodules rich in valuable metals lie in a strip approximately 2,500 miles long and 500 miles wide, stretching from west of Mexico to south of Hawaii. The major consortia are prospecting for suitable claim sites in these deposits.

The miners face three sizable questions: How can

Technicians adjust a grab sampler, designed to pick up nodules, before its next launching.

Jim Lawless and Brian Hoyle, of National Oceanic and Atmospheric Administration, inspect bridge.

nodules be retrieved from such deep water? What will their collection and processing do to the environment? And who, if anyone, owns these minerals and can award exclusive claims to competing companies?

The first question is proving the easiest of the three to answer, even though continuing uncertainties posed by the other two have limited funds spent on research and development. People like Bill Siapno have designed hardware capable of bringing up nodules. Some of it is still in the planning and prototype stage. Some involves space-age electronics, and some remains closer to the baling-wire and chewing-gum variety.

An example of the last category is the boomerang grab sampler (above), resting on the deck of the *Prospector*. This strange Rube Goldberg device characterizes the field's homebrew hardware. Deepsea Ventures suspected where to stake its claim primarily on the basis of underwater television. They needed, however, to assay the nodules' metal ore levels. So they bought the sampler—a mechanical shark to grab nodules and return them to the surface. The contraption is five feet tall, weighs 40 pounds, has a bulbous float in its midsection and below that, steel jaws that snap shut a nylon bag. Ninety pounds of steel shot carry the sampler down. The jolt of hitting bottom trips a trigger and the jaws swallow ten pounds or so of nodules and seabed ooze. The shot falls out and the sampler, now buoyant, starts upward. The intense pressure at 15,000 feet has crushed an ampule and a green chemical light glows. When the sampler breaks surface, an orange flag flaps, a radio beacon and strobe light begin to signal and the sampler bobs in the water, blinking, beeping, glowing and cradling its nodules until the ship returns.

The *Prospector* may launch nine grab samplers in a row, then circle back to harvest the bites of ore. This sounds easy, but the weather during the two-day shakedown cruise demonstrated how hard the task can be. An impenetrable fog bank met the steel gray water in

Oceanographer Royal Hagerty checks monitor showing nodules which camera can see 15,000 feet down.

a circular horizon just a half mile from the boat. It was nearly impossible to see when the boat had changed direction save by its curving wake. The key to sampling, and nearly every step in ocean mining, is precise navigation.

The *Prospector* may look like an "old bucket" but her below-deck laboratory has a complicated navigational system tied together by a small computer. Every ten seconds, the computer collects data on the ship's speed, direction, drift and position relative to satellites and, sometimes, transponders placed on the seabed. New readings appear every minute on video display terminals and the ship's track is automatically drawn on a plotter.

The computer controls another critical function. A traditional miner begins his search with a detailed map of the area. Ocean prospectors, however, must first make their own detailed maps of the hills, clefts and contours that lie below and could endanger the machinery that will later mine nodules. Deepsea Ventures uses a custom-designed depth-sounder to bounce acoustical signals off the sea floor. These produce readings which the computer integrates with the navigational data. A large computer on shore then extrapolates to produce a bathometric map.

A submerged television camera acts as remote eyes to view the position and density of nodules (above). These data are painstakingly recorded and integrated onto a latitude and longitude grid. The exact position, density and assay of the nodules—as well as the positions of scarps and boulders—would have to be known long before the commercial mining vessel made its way to the spot.

A free-lance writer specializing in scientific topics, Janet Hopson last wrote for SMITHSONIAN *in January 1981 on the duck-billed platypus.*

None of the consortia has yet invested in a full-scale mining ship, but they would be enormous vessels, capable of operating nonstop for months at a time and scooping up millions of tons per year. Nodules could be transferred to bulk carriers which would shuttle between the mining ships and shore processing plants. Much of this technology is being borrowed from established fields. No other industry, however, has tried anything like picking up seabed minerals. The magnitude of the costs—and the rewards—has intensified natural competition. Those involved tend to be secretive about the technologies they are developing; while the general principles are known, details are still being worked out and often regarded as trade secrets.

Basically, companies are considering three approaches (pp. 56-57): scrape nodules into buckets on a very long rope, send swimming robots down to gather them directly, or suck them into a giant vacuum cleaner. So far, only some small prototypes have been tested and it's not clear which approach will prove to be the most reliable.

One international group has been called the Con-

Precise navigation is crucial so that miners can return someday to areas of heaviest concentration.

tinuous Line Bucket Group—a graphic description of its collector technology. A 40- to 50,000-foot cable would be strung with dozens of huge buckets and would hang in a gigantic loop beneath the ship (or beneath two ships, depending on design). As the ship moves forward, the buckets would scrape up nodules and lift them to a hopper. Sediment is washed away as the buckets come up. This design may be cheaper than the others—although the buckets tear a swath through the bottom sediments and the looped cable can tangle.

A French consortium has designed a fleet of remote-controlled shuttles to descend in a continuous train, then bring nodules back to a huge floating platform. Competitors jokingly call the submersibles "water beetles" or "magic buckets." This system has a certain romantic appeal and would eliminate handling miles of cable or pipe. But the complex technology involved can produce its own problems of breakdowns and costly repairs.

Four consortia have turned to the vacuum cleaner or hydraulic-lift concept. The upper part of the design is roughly the same for all: an oversized soda straw called a "pipe string" weighing one million pounds and reaching to the ocean floor from below a derrick on the ship. A strong upward flow created by injecting compressed air down the pipe or by submerged pumps will draw the nodules up. Deepsea Ventures is planning to attach a relatively simple 30- to 40-foot-wide "dredgehead" to the bottom of the pipe string to rake, sort and swallow nodules as the collector is dragged through the soft sediment on runners. Another variation is a dredgehead, also pulled by the movement of the ship, which has a motor-driven rake to help gather nodules.

The Kennecott consortium also has tested a dredgehead that separates nodules from the mud. And the Lockheed consortium's collector is worthy of a firm that also builds satellites and missiles. Self-propelled, it drives itself through the abyssal ooze on giant Archimedes screws. It has a power transformer, nodule crusher, flotation system and a television camera. If it works well, it will be able to mine hilly and other less accessible areas. Such a complicated dredgehead, however, raises the odds on malfunction and to repair any collector could stop the operation for a week—much of that time spent hauling up and redeploying.

Practical details can be attacked with a steady infusion of time and capital. The start up of full-scale mining, however, depends on the answers to the environmental and political issues, as yet unresolved—a corporate Catch-22 of impressive proportions.

On the shakedown cruise, I joined the miners before a bank of TV monitors, watching a long narrow band of the benthic environment below the moving hull. Appearing on screen was more life than one

Color-coded strips show nodule density on grid of ocean bottom; partly-filled circles are sample results.

might expect in such deep water. Some were familiar—hunks of sponge, starfish, sea cucumbers. Others were less so—acorn worms, primal-looking pipefish, tracks of unknown animals, puffs of sediment raised by frightened creatures.

The deeper abyssal ocean—once thought to be a lifeless desert—is now revealing a diversity of species that rivals the warm, shallow waters of the tropics. There are fewer individuals, though, and they seem to live in slow motion. The water is 35 degrees F; no light at all reaches the seabed; the pressure is greater than three tons per square inch, and much of the food filters down from the distant surface in a slow rain of tiny particles. A clam can take 60 years to reach sexual maturity. In time-lapse photography, one object that looked like a rock for three months got up and moved several inches. Another "rock" sprouted an arm, waved it for a few hours, then sat motionless for six more months. Aside from an occasional shipwreck or falling debris, the deep abyss covering most of the Earth's surface has thus far remained untouched by Man's activities.

The dredgeheads, pipe strings, bucket lines and submersibles would descend into this languorous kingdom and begin to tear up the seabed and its odd community. No one denies that the bottom life within a mining claim would be thoroughly disrupted or destroyed and might take decades to regenerate itself. (The proposed mining sites, of course, are tiny compared to the vast Pacific.) Neither does anyone deny that bottom sediments, nodule fragments and other debris would be released close to the surface, clouding the water for a time and altering the activity of phytoplankton to at least a small degree.

Environmental studies by the National Science Foundation, the National Oceanic and Atmospheric Administration (NOAA) and others seem to have given ocean mining a preliminary nod, however. Even powerful national environmental groups consider nodule mining to be relatively clean. This tentative approval, of course, is based on the assumption that future research does not alter our current understanding of what the effects would be.

The ultimate environmental question is perhaps beyond quantification: should we, as a world society, refrain from mining the abyss precisely because it is a deep, remote and unknown world that has remained undeveloped until now? Dr. Sylvia Earle, a California marine biologist and oceanographer, thinks that in many ways, this would be the best solution. "We live

Vacuum cleaner
In the most popular approach, dredgehead rakes up nodules, which are then sucked up through pipe string by compressed air or submerged pumps to ship on surface.

Artist's cutaway illustrates the general principles behind ocean-mining methods now being developed.

Bucket brigade

With the conveyor-belt method, buckets are dragged through seabed sediments. The mud washes out as the buckets rise to the surface, leaving nodules.

Water beetles

Remote-controlled mining shuttles would scoop up nodules, return to platform. Each shuttle carries television camera and lights, so that it can be steered from above.

at a pivotal time in history," says Dr. Earle, a petite, soft-spoken woman, "the first time in civilization when mankind can make this kind of impact on the deep sea. All we really know now is that our ignorance of this resource is vast."

Since, however, mankind is likely to begin mining the deep oceans anyway, she says, it should be done only with appropriate safeguards and the willingness to modify our approach if it proves hazardous to the environment. It would be tragic to rush in blindly and alter the deep-sea benthos without knowing what the effects will be, and it's "really mad" to use up the continental minerals easily reached in a few generations, then start on the ocean minerals. We face a once-and-never-more decision, she says, to protect and manage this resource. Once we have begun mining, "we are committed. We have bitten into a million years of history for the first and last time."

Dr. Earle's position is seen by some as unrealistic, in the face of predicted mineral shortages. Her opinions, however, did have one tangible effect on the new U.S. ocean-mining law that is resuscitating the stalled industry. "Stable reference zones," undisturbed areas of seabed equivalent in size to the mining sites, will be set aside and preserved for scientific study. "These areas," says Dr. Earle, "are a hedge against the unknown and a philosophical commitment to measuring the real effects of full-scale mining. If necessary, we could then tighten the environmental regulations."

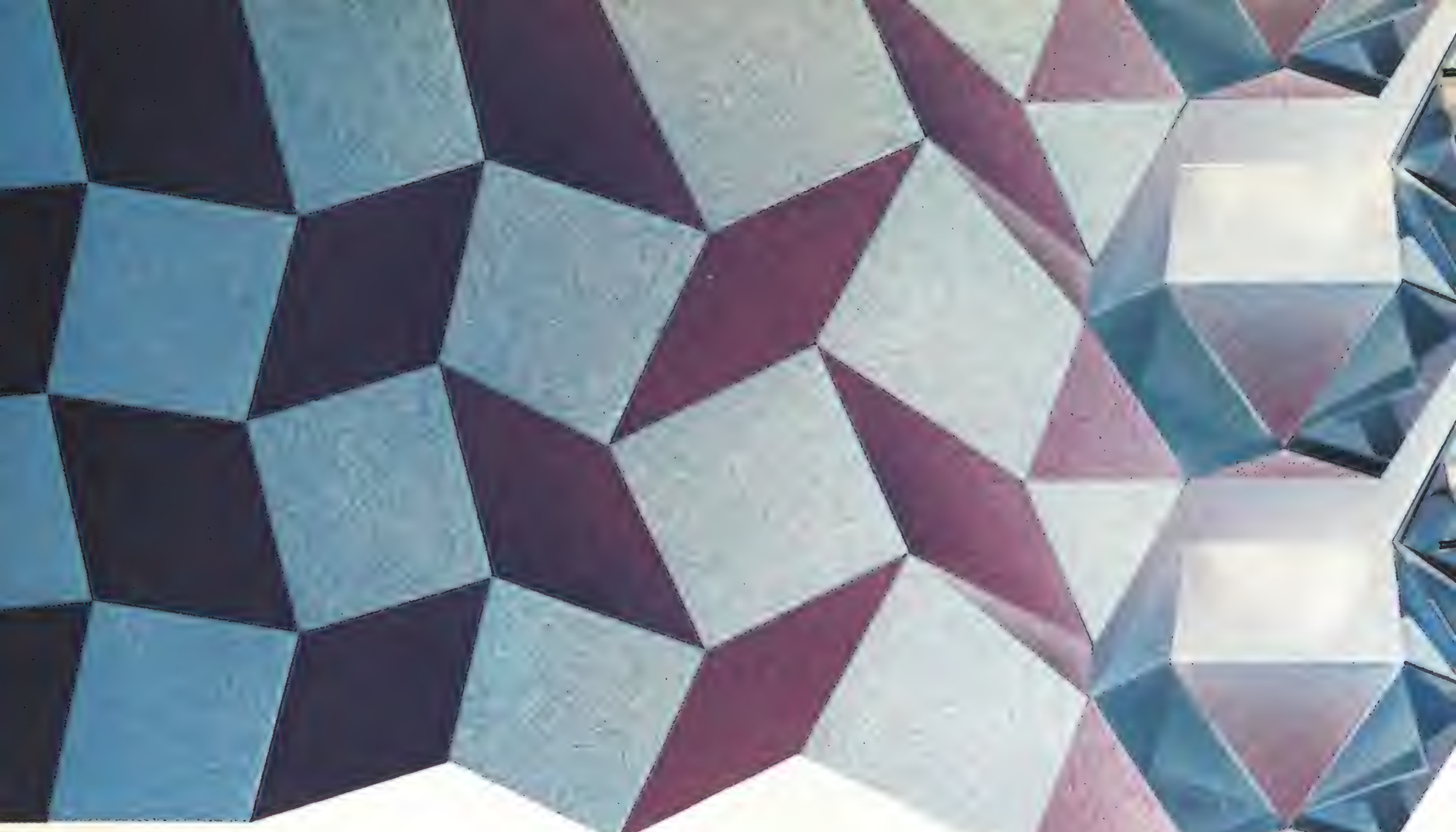
The enforcement of these regulations as well as the licensing of U.S. companies and the awarding of mining claims will rest with the newly created Office of Ocean Minerals and Energy, part of NOAA. At this point, however, no one knows what form ocean mining will ultimately take. It all depends on the U.N.'s Law of the Sea treaty (LOS), a seven-year, global political effort to create controls for roughly three-quarters of the Earth's surface. This international treaty, still in draft form, has been compared to the Code of Justinian as well as, less generously, to a "feeding frenzy" by the world's less developed countries. The current draft firmly answers the major question facing ocean mining: the nodules are *not* the property of the first countries with the technology to take them, but rather the heritage of all mankind, to be regulated solely by a proposed U.N. seabed authority. The authority would license and allow private companies to mine—but only in tandem with a U.N. ocean-mining company called the Enterprise. Royalties would go to less developed countries, and strict limits would regulate the production of ocean metals so that land-based mines (many in those same Third World countries) would not suffer price competition from the new industry with its plentiful resource.

Ocean-mining consortia have characterized these and other provisions as so onerous that the necessary start-up investment—which could run close to a billion dollars for each—would not produce adequate profits. Many Third World delegates to the Law of the Sea Conference, on the other hand, see the recent U.S. law (strongly backed by industry) as an end run around the U.N.'s authority over deep-sea minerals. That federal law permits commercial mining to begin in 1988; but if and when the international treaty goes into effect, U.S. mining operations would have to be consistent with it. The Reagan administration has found some problems with the current draft treaty, and has raised questions about whether it offers the U.S. mining industry access to the minerals on "fair and reasonable terms." The administration has instructed the U.S. delegation to the Law of the Sea negotiations not to complete a treaty until a new policy review takes place in Washington.

In the meantime, the new industry of deep-ocean mining hangs in a political limbo. It moves tentatively forward only on the strength of the new federal law, knowing that a U.N. treaty could later drive the cost of business beyond hope of return. Whether nodules will ever be collected will likely remain unanswered for some time.

In a world of shortages and rising expectations, there will always be a new technological horizon. The history of nodule mining, however, shows that future industries must fit into an increasingly complex environmental and political order that is itself a frontier effort. Clever technology alone may no longer solve the world's problems.

Tripod holding deepsea TV camera is winched on board *Prospector*. Camera is towed along bottom.



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The knowledge business

Aloft in a cherry picker, Liebs prepares to document downtown Richmond, Vermont, in photographs.

By Richard Wolkomir

Old McDonalds have a friend: his name is Liebs

His game is seeking out architectural 'gems' of this century—drive-ins, supermarkets, gas stations—and saving them for the future

Chester Liebs points accusingly at a photograph of Washington, D.C.'s Greyhound bus depot, c. 1940, where the streamlined, curvy walls have been covered over with blocky concrete and thus "modernized."

"This building embodied all the speed and excitement of a new kind of transportation, and now it looks like the Confederate ironclad *Merrimack*, floating down New York Avenue," fumes Liebs.

He is director of the Historic Preservation Program at the University of Vermont. He also is a founder of the American Society For Industrial Archaeology and the American Society For Commercial Archaeology. And he is angered by all sorts of insults to America's "built environment." But it is not just the Mount Vernons and Gettysburgs that fire his crusades—it's also the Lindholm Diner in Rutland, Vermont, "a rare streamlined diner designed by the Judkins Company, custom coach builders." The diner, sighs Liebs, "has now been encased in vertical board siding and, of course, the ubiquitous mansard roof (p. 65)."

Is the diner pretty? Or, esthetically, is it junk? "Pretty, ugly—that's beside the point," says Liebs. "The important thing is that it is *information*."

Chester Liebs is something new: just as traditional historians read documents, he "reads" buildings. Early in his career, he was strolling down a New England dirt road with an archaeologist, who pointed at a leaf-strewn meadow and said: "What do you see?" "Leaves," said Liebs. "No!" said the archaeologist. "See how the leaves have blown into the depressions left by building foundations, outlining them—you're looking at an abandoned village."

The idea suddenly came to the young preservationist that the "built environment"—houses, factories, stores, highways, railroads—could be read like a book. It would be a new way to study history, above-ground archaeology. And the edifices we built could give us information about our culture unrecorded in our documents and annals.

Today buildings talk to Chester Liebs. The color and pattern in the slate roof of an old brick house, long-since converted to apartments, says "Spanish-American War era." The style of an added-on porch tells him exactly when the neighborhood began to decline. "What year were these shops built—look at the cornices!" he tells the graduate students who trail him like disciples following a swami, studying neighborhoods and old buildings across the country. "Why was this street widened in 1893? Why was major construction going on then?"

On Boston's Museum Wharf, a 44-foot milk bottle of the 1930s now sells yogurt. Liebs applauds its reuse.

MUSEUM
WHARF

Savior of architectural 'gems'

Liebs inspects Boston's marble-columned Clark and White 1920s showroom, a type he aims to save.

J. C. Tomasi in his Candy Shop—a fixture of Salem, New York, since 1918. Liebs wants it preserved.

Columns, windowsills, dingy 1840s brick shops clustered along a river, shunned by newer houses beyond the railroad tracks, a Texaco station's shape, renovations to a supermarket, c. 1955, the design of traffic lights—all these details tell Chester Liebs what has happened in a town. He is a kind of architectural Sherlock Holmes.

"Look at this," he says, flashing onto a screen a slide of a paint chip taken from a Renaissance building in Italy. "You can see that for centuries the air was clean, then in the top layers the pollution smudges get thicker and blacker—just in a paint chip you can see a cross section of time."

Time obsesses him. "Ticktock, ticktock, each day an era looks slightly different," he says. "You buy glasses with a new shape, you get a smaller car, you decide to expose the beams in your living room. We need to develop what the European countries have, a sense of ourselves, to preserve from the past enough to give us the context, because without those roots you can easily run away from yourself."

In his war against the defacers of diners, the levelers of classic Gulf stations, the despoilers of 1830s tanneries, the troops are his graduate students, full of fervor. But Liebs also schedules important classes for the evenings, so that civilians can sign up—high school teachers, lawyers, real estate agents, architects, builders, government officials, masons, carpenters—hundreds have been given the new religion. He also organizes summer institutes that attract more people from around the country.

"We've had people from as far off as Wyoming and California, even England, taking these courses—they *have* to have an effect," he says.

New Englander Richard Wolkomir wrote about the Army's Hanover "cold lab" in the February issue.

Former Lindholm Diner in Rutland, Vermont, is intact under a new name and modern sheathing.

New "old-style" door to restaurant cloaks the old "modern" stainless-steel door of the encased diner.

Recently, some of Liebs' graduate students were circling over St. Albans, Vermont, in a Cessna, shooting aerial photographs. They feared that the city's efforts to revitalize the downtown area might result in the loss of many of the remaining 19th-century public buildings as well as architecturally significant residential and commercial structures. Focusing their attention on the economic and planning issues facing St. Albans, rather than targeting a few individual buildings for preservation, they concluded that the city had sufficient economic potential, but suffered from "a severe case of poor self-image."

Armed with photos of land-use patterns, economic analyses and inventories of historic buildings, the preservation fighters struck. St. Albans awoke one morning to find that an exhibit of the town's physical evolution was occupying a downtown shop window. High school students were treated to walking tours, firing their enthusiasm for the city's history as an early turnpike town, then a railroad center. Barrages of articles went off to the newspapers. Then the students unveiled their secret weapon: a scale model of St. Albans with removable buildings. This could instantly show citizens how any of the proposed changes to downtown would look.

City business leaders sent up a white flag. They voted to set up a committee that would assure careful management of the city's architectural resources in any revitalization efforts—a position in line with Chester Liebs' dictum: "Historic preservation *must* be related to a city's economic needs."

Liebs allows himself a satisfied smile: another skirmish won in the war to save America from America. There have been other victories. Organizations like the Society for Commercial Archaeology have helped to foster a national climate that encourages preservation of important architectural artifacts, including some of those from our more recent past: a 1930s Shell station shaped like a shell in Winston-Salem, North Carolina; Milwaukee's 1930s Clinton Street filling station; Fowles' News Store and Soda Shop in Newburyport, Massachusetts; Harold's Army and Navy Store, c. 1930, with a Carrara glass front, in Corning, New York, and so on.

On April 20, 1977, tourists on Boston's waterfront stared as a tug steamed into the harbor, pushing a barge. Riding imperially on the barge was a three-story-high wooden milk bottle (p. 63).

The 44-foot-high, 15,000-pound structure was built in the early 1930s by Arthur Gagner and was purchased later in the decade by the Sankey family. Located on Route 44, near Taunton, Massachusetts, it served as a dairy bar until 1967, but then—boarded up—the bottle began to deteriorate. In 1976, with the help of H. P. Hood, Inc., a leading New England dairy products company, the building was restored and transported to Museum Wharf where the Boston Children's Museum and the Museum of Transportation became the proud new owners. Now it stands outside the museums, spiffed up and selling frozen yogurt.

Saving the Sankey milk bottle, says Chester Liebs, was "probably one of the most significant preservation efforts affecting a 20th-century historic American roadside building."

Savior of architectural 'gems'

At a fast gait, Liebs (in striped tie) leads his students on Claremont, New Hampshire, field trip.

Is he kidding? Liebs bangs his forehead on his desk in mock exasperation. He has heard that question a million times. And he hates it.

"Our society is ruled by the quest for economic gain, and to understand it we have to study the effects of industry, of marketing, because you simply cannot understand the American experience in terms of what is pretty or ugly.

"I don't want to be Mr. Commercial Archaeology, because I do a lot more than that," he adds. "But the popular architecture of today—the diners, the gas stations, the fast-food emporiums—all have roots deep in the past."

At least as far back in the past as the Enlightenment and the Industrial Revolution, he argues, there were powerful economic forces at work. During the 19th century we developed a manufacturing system that eventually outstripped the demand for basic products, then had to create a demand for new products to keep the machines turning. We became a very self-conscious society, studying ourselves to sell to ourselves, master manipulators of images.

Most of all, says Liebs, there was the automobile. Highways became the lines of force along which commerce and communities grew. We began to organize our lives around the automobile, as the designs of our shopping centers and the shapes of our towns all testify. Now, oil pumps are running dry and the great automobile age is slowing, changing. And with much of the architectural effluvia of the auto age—the burger palaces, the drive-in movies, the strips—still in place, this is the time to study the phenomenon.

Liebs crisscrosses the country, speaking, teaching courses, lecturing, preaching his gospel of preservation.

"I'm not the champion of saving every roadside artifact, any more than I think that every artifact of any era should be saved," he says, "but, somehow, you must leave enough information around from every era so that each generation has a long-term backdrop for understanding itself."

As late as the 1960s, he points out, Victorian buildings were razed without a tear being shed and Victorian furniture rated only a snicker. Now everybody loves Victoriana. And Liebs believes the fast-food restaurants and highway signs of today will become admired objects, too, once the auto age starves to death on high-priced fuel. But the highway strips—the architecture of ephemerality—could vanish in a twinkling, leaving a gap in the physical record.

"At the present rate of removal, by the year 2000 we might be the proud possessors of an environment replete with vestiges of the Victorian and earlier eras, but with almost no remaining movie palaces or exuberant bits of mimetic architecture, like cheese stores in the shape of cheese wheels," Liebs predicts.

He notes that, in historical museums across the nation, children are reverently paraded past Model T Fords, kerosene lamps, crank-up phonographs, "Grandma's" artifacts. "Ironically, the grandmothers of a sizable portion of living Americans drove streamlined automobiles, riveted B-29s and P-38s in World War II, and were awestruck by the age of the future promised at the 1939 New York World's Fair," he says.

His own preoccupation with the passing of time and the past began in childhood, a legacy from his father, the president of a printing company. The elder Liebs had a keen eye for his surroundings in the New York City metropolitan area. And he made sure his son became an observer, too.

"Even when I was very young he made me aware of Roosevelt Field on Long Island, where Lindbergh took off, and of the great estates on the North Shore, which had been subdivided. I became highly aware of the terrible pace of change, how 19th-century America was being converted very, very rapidly, because everywhere you went there was construction, things being torn down."

As a student in the early 1960s, he watched New York City's Pennsylvania Station being razed, stunned by the realization that "much information and value was being lost." He decided to make his career a study of history and the preservation of historical artifacts.

One of the first graduates of Columbia University's pioneer preservation program, he went on to serve as curator of history for the New York State Historic Trust. Then he was field historian for the Historic American Engineering Record and Vermont's supervisor of historic sites.

The preservation movement took off in 1966, with the passage of the National Historic Preservation Act: "A kind of euphoria set in, as we did inventories of American architecture, not just historic shrines, but the whole bloody patrimony." Preservation took hold just then, he believes, because—with city after city losing its downtown—the country "felt the first terrifying tremors of future shock."

Does our new interest in America's past mean the country is finally moving out of its adolescence and into maturity?

"No," says Liebs. "The country has finally crossed the line into adolescence—we're having to make profound decisions and we're having trouble." And he adds: "We're not turning away from the future when we study the past, we're preparing for it."

Twentieth-century artifacts are only part of Liebs' concern. For instance, he participated in the excavation of Fort Orange, which was smack in the path of an Albany, New York, highway project. "We discovered that those earliest Dutch settlers, in that wilderness, actually lived fairly sophisticated lives, like people in a Vermeer painting," he says.

Today the program he started at the University of Vermont has become a national center for preservation studies, one of a handful in the country. An example of the University of Vermont's broad-scale outreach program is its new preservation laboratory, a resource for preservation projects anywhere.

The lab's young director, Philip Marshall, is currently studying slate: locating the original quarries, identifying the various types of slate, locating sources for similar slates today, finding skilled craftsmen who can work with slate. If an architect brings in a piece of roof slate, Marshall can tell him where to find a replacement, how much the new slates will cost, how much breakage to expect in laying a new roof. He also acts as a consultant for such projects as the restoration by the Society for the Preservation of New England Antiquities of the Morse-Libby Mansion, an 1860s Italianate villa in Portland, Maine.

Marshall is typical of Chester Liebs students: he began as a geologist, studying geothermal structures in Iceland and Kenya. One day, watching workers restore a building, using unnecessarily harsh chemicals to clean the stones, he decided that a geologist would have much to offer in historic preservation work. Now a graduate of the University of Vermont graduate program, Marshall presides over an odd laboratory that has bricks instead of books on its shelves and an 1870s metal building cornice leaning against one wall.

Milwaukee gas station, attention-getter when built in 1930s, is pride of owner Harley Sprague.

Liebs calls Lambertsville, New Jersey, store "time capsule of post-World War II supermarketing."

Savior of architectural 'gems'

Liebs students know how to preserve 200-year-old bricks; they know the economics and legalities of preservation projects, and how to "read" a street. They fan out through the country, spreading the religion. "For instance, one of our graduates, now working with the National Trust for Historic Preservation, has helped an entire city in the Midwest rebuild its sense of identity and image," says Liebs proudly.

"We're getting away from the study of documents alone," he says. "We need other types of input to understand our development—oral tradition, the understanding of landscape, the social implications of architecture. All are parts of it."

So are pizza palaces and car washes: "The gasoline station provides us with essential clues when we are looking at the automobile's impact on the American landscape."

He picks up a magazine article and waves it in the air, scornfully. "Somebody says in here that the next thing you know the preservationists will be trying to save the first McDonald's stand," he scowls. "That is very ironic, because anybody with any sense of history or context would see that fast foods have had an enormous impact on American life, and that 100 years from now the first McDonald's is going to be a very important artifact—that's not a joke, it's just logical."

Hang around Chester Liebs and your eyesight sharpens. You begin to be struck by the difference between a New England-style diner and the more streamlined, flamboyant Jersey-style diner. You learn that early gas stations, built out in the suburbs, were designed to look like suburban houses, and learn that an unaltered 1950s supermarket can be rarer than a pristine Stanley Steamer.

Also, you learn why people may laugh at the concept of studying gas stations and highway intersections. "You know why?" he says. "Because in the 20th century people are scared witless of technology—and they're embarrassed, because the automobile controls them, embarrassed and frightened by the fact that now the closure of the Strait of Hormuz would jeopardize their entire life-style."

His own aim: "I try to give people a context for the decisions we've made, so we can understand American society, which means looking at the entire picture, the Plymouth Colony, certainly, but also the design of a supermarket," he says. "We have to understand why decisions were made, how they were made, how places grew, how people spent their money, what the politics of development were—it might help us in the future."

Hard as it is to believe, the 20th century—so sleek, so modern—is now a senior citizen, 80-plus years old. We already live in the past, says Chester Liebs. We may not like all the objects we have produced, but can we ignore them? Ralph Waldo Emerson said over a century ago in *The American Scholar*: "I embrace the common, I explore and sit at the feet of the familiar, the low." Liebs has taken that as his text.

Philip Marshall, graduate of Liebs' program, studies architectural ornament in preservation laboratory.

Liebs stands protectively by Newton, Massachusetts, gaslight post; few such systems are still left.

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By Herman J. Viola

Indians braved Washington to see the 'Great Father'

Hundreds of delegates in buckskin risked perilous journeys, urban rip-offs and white man's illnesses for diplomacy's sake

In two Pope motorcars of 1904 (left) and 1905, delegation of Yankton Sioux, resplendent in

"Father, I am glad to see you. I hold out this pipe, and I take your hand in friendship. A cloud has been between us. It was thick and black. I thought once it would never be removed. But I now see your face. It looks upon me pleasantly. A long way stretched between us. There were those who told me it was blocked up. They said the Red men could not pass it, but I attempted it. It is like the plain path which conducts us to the Great Spirit. Father, when I came in sight of your home it looked white and beautiful. My heart rejoiced. I thought now I should talk to you. Father, the Great Spirit gave to his children, the Winnebagoes, a pleasant plant. It is good to smoke. I give it to you in peace. Father, my heart is true. They told me your heart was black. It is not so. We salute in friendship."

Thus spoke Nawkaw at a White House ceremony in 1828. His words were translated twice—first into French, then into English. President John Quincy Adams replied with the same dignified oratory:

"Tell him it has grieved me that a cloud has been between us, but I am pleased equally with him that it has . . . dispersed like the fumes of the pipe we have smoked. May it never close down upon us more."

President Adams handled the gracious phrases easily, for hearing such speeches from proud Indian leaders and responding in kind was part of the day's work for American administrations until relatively recent times. Again and again, Washington was the scene for diplomatic confrontations with Indian leaders who tried to defend tribal interests from the United States through negotiation rather than warfare. Contrary to the usual stereotypes, the Indian tribes preferred peaceful solutions to their problems with the whites. As for the United States, especially in the years immediately following the Revolution, more war was something the new republic could ill afford. It was more effective, and a lot cheaper, to entertain important chiefs and warriors at the capital and convince them of the folly of military defiance.

So the Indians were brought to Washington at government expense, met the President, were showered with gifts and guided on tours of arsenals, battleships and forts. They were also expected to see the superiority of civilized life.

This aspect of delegation policy was a signal failure.

feathered war bonnets, tours past the Capitol.
Sightseeing was calculated to impress the visitors.

Few Indians returned home wanting to trade places with their white brothers. One puzzled government official, who had accompanied a Sioux delegation on a tour of New York City in 1872, wrote, "It is curious, and almost a painful fact that nearly all these Indians were often so home-sick that they would urge the agents to move on, as fast as possible, toward their wild homes in the remote West."

Still, serving as a delegate for the first time must have been an overwhelming experience for an Indian. He traveled first-class, received the latest clothes and stayed at the best hotels. Everything was new and exciting. Things the average white citizen took for granted—mechanized travel, multistory buildings, ready-to-eat meals—were wonderful to the delegates.

Sometimes "civilized" life seemed terribly dangerous. In 1880 an eastbound passenger found himself sharing a coach with a Crow delegation that boasted six important war chiefs. The delegates seemed at ease until the train plunged into a tunnel. When it emerged from the darkness a few minutes later, two of the delegates were found crouched under their seats.

An agent accompanying the Red Cloud and Spotted Tail delegation of 1870 overheard several of the Indians discussing the multitude of white people they were seeing. The astonished warriors could only reason that the same people were reappearing in each city. They were convinced that white men, with superior technology, had developed the means of moving whole cities just as the Sioux themselves could do when they moved tepee villages from one site to another.

Gifts measured Federal sincerity

Indians placed great emphasis on the quality and nature of the gifts they received and viewed them as a measure of the sincerity of the government's deliberations. As one official expressed it, "Without presents Indians have no ears."

Consequently, delegates were given military coats with epaulets, hats, ruffled shirts, pants, boots, silk and cotton handkerchiefs. They were fitted with swords, rifles, blankets, plows and tools. Most impressive were peace medals and American flags. These carried the full weight of national allegiance and conferred added status and rank upon the recipients. Bearing the likeness of the incumbent President, solid silver American medals were made in three sizes, very important for recognizing tribal hierarchies.

In return, the Indians presented buffalo robes, calumets, moccasins, war shirts and feathered headdresses to the President. These were often personal possessions and the most significant gifts they could give. Most have been lost. A few that survived are treasured at the Smithsonian.

When the delegates returned home, they showed off the grand outfits they had been given, or had bought—generally including an umbrella—and often threw their families into a state of shock. Luther Standing Bear recalled that the first time his father returned from Washington, the children thought a white man had come to visit—silk top hat, starched shirt, Prince Albert and all. "He looked so funny to us . . . he even had kid gloves and a cane, but with all this white man's stylish make-up, he still wore his hair long."

Chief Standing Bear was so pleased with his outfit that he wore the starched shirt to bed that night. The next day he wore the clothes to a council meeting. The only change was an eagle feather tucked in the hatband. "Whenever a man returned from Washington

The Jicarilla Apache delegation posed before paintings in Washington's Corcoran Gallery in April 1880. The collection was then housed in what is now the Smithsonian Institution's Renwick Gallery.

and attended a council, he was expected to come dressed up," Luther Standing Bear recalled. "This was a sort of 'badge,' to prove that he had been there."

Within a few days the old man lost interest in his new wardrobe. Even the top hat lost its charm. Standing Bear's little daughters used it as a water bucket.

When the chief called The Light returned to his Assiniboin companions after visiting Washington in 1832 (p. 76), his new clothes and umbrella failed to impress them. Neither did his fantastic tales of the marvelous things he had seen in the East. When he described the Baltimore shot tower to a group of skeptics, they hooted at the idea of a building so tall. Angry and disgusted, The Light broke his prized umbrella over the back of one obnoxious heckler and stalked off into the darkness. The heckler, in turn, got his gun and killed the former delegate as he sulked in his tent.

The rough behavior of the delegates could sometimes cause problems. Those Winnebagos of 1828, whose chief voiced such resounding intentions, took part in Washington antics that certainly went unappreciated. According to Washington socialite Margaret Bayard Smith, the "ferocious Winnebagoes," (as she called them) chased after and caught several young ladies, whom they held "in their arms and kissed, till decent young women are nearly afraid to walk out." The delegates did not frighten all the women they met, however. Two chiefs are known to have returned home with wives they wooed and wed while they were in Washington.

In selecting hotels for the Indians the government was guided by economy and convenience; hotels near government buildings minimized the need for carriages and cabs. For almost the entire 19th century the going rate for housing delegations was $1.50 per person. That included meals and room but not laundry and barbering.

For more than 50 years, from 1854 to 1909, the delegation trade was dominated by the Beveridge family—Amanda, her son Benjamin, and his daughter Louise.

Dr. Viola's article is based on his book, Diplomats in Buckskin, *published by Smithsonian Institution Press. He directs the National Anthropological Archives.*

After a visit to A. Saks and Co. and the expenditure of $166, the same delegates posed again on the same day in more conventional Washington clothes. Behind stands their interpreter. Agent sits on bench.

The family hosted almost every prominent Indian leader to visit Washington: Red Cloud, Spotted Tail, Satanta, Joseph, Geronimo, Quanah Parker. Amanda Beveridge began with a small boardinghouse on Pennsylvania Avenue. Within a few years she had become the proprietor of a large hotel at the northwest corner of the Avenue and Third Street. She changed its name to the Washington House and quickly established a fine reputation among the Congressional corps for good food and service. Indian delegations eventually made up a major portion of the clientele.

Though they stayed at the best hotels, the Indians did not always receive first-class treatment. They did not mingle with other guests and often ate their meals at separate tables. And it was not uncommon to house entire delegations in a single room with no beds or furniture. Not all Indians accepted such treatment patiently. Little Crow complained in 1858, "We thought we would come here and live like white men and sleep in beds, but we had to sleep on the floor." Four years later he led the Santee Sioux uprising, which raged through Minnesota.

The innkeepers had their own complaints, of course. Hosting Indians on their first visit to a city could eat up the hoped-for profits. Smashed furniture, broken windows and mirrors, and hearty appetites were part of the price. Even Amanda Beveridge, with her years of experience, had problems. In 1877 she lodged a large Sioux delegation at the standard rate of $1.50 per person, but added to her bill an extra charge of $25.40 for the gaslights used in the rooms.

The commissioner of Indian affairs refused to pay. Amanda retorted that even at $1.50 she lost money, and claimed that "a strong healthy Indian will consume nearly that amount in meat per day." Perhaps the commissioner did not realize that Indians were "in the habit of sleeping all day, and amusing themselves by singing . . . all night." As a result, she grumbled, Indians consumed a full flow of gas every night for the ten days they were at her hotel.

Delegates met with government officials, Congressmen, interest groups and other delegations, and the inevitable prelude to each meeting was the lighting and passing around of a calumet, or peace pipe, often

National Museum of American Art, Smithsonian Institution

George Catlin depicts Assiniboin chief, The Light, coming to capital and leaving in ill-fated garb.

Fierce-looking Ponca delegates sat for famous western photographer William H. Jackson in 1877.

to the distaste of government representatives. The Oglala Sioux enjoy relating an anecdote about one official who received the pipe during a ceremony and carefully wiped the stem with his handkerchief before putting it to his lips. This so offended the owner of the pipe that when it was returned to him he took out a knife and cut the stem off.

The highlight for the delegates was their audience with the President. To the Indians, he was the Great Father, a term of respect, not subordination; he was never Great White Father. The Indians proudly wore the peace medals that bore his likeness, and meetings at the White House were carefully arranged ceremonies with much pomp and colorful pageantry.

Other stops on the tourist circuit were the Marine Barracks, Navy Yard and Washington Arsenal, where various weapons were demonstrated for their education. Field guns that could destroy wooden targets with remarkable accuracy, huge shore guns that shook the earth and hurled thousand-pound projectiles at an unseen enemy miles away, and Gatling guns with seemingly inexhaustible ammunition were weapons beyond the wildest Indian imagination. But what amazed them most were tens of thousands of muskets, stacked and ready for use.

Although the Indians much preferred outdoor activities to sitting in stuffy theaters watching the latest comedy, all delegations had to endure some exposure to the cultural life of Washington. They were apparently as much of an attraction as the performances, judging from the advance publicity given their appearances. The audience attending a ballet at the National Theatre in 1837 received a double treat. A Sioux delegation was watching a ballerina in her role as a forest sylph. The Indians were entranced not only

Big Snake, far left in second row, seems to be giving "red power" salute a century too early.

by the dancer's grace and beauty but also by her crown of ostrich plumes, which flashed and fluttered as the the ballerina darted lightly across the stage. Suddenly, a warrior rose and tossed his war bonnet of eagle feathers at her feet. A second bonnet soon followed, and the ballerina stopped dancing. Another chief then stepped forward and handed the startled woman his splendid robe of white wolf skins. Still another passed her his beautifully painted buffalo robe.

The quick-thinking young woman acknowledged the gifts by plucking the ostrich plumes from her crown and giving one to each delegate. Next day the

Courtesy of Gulf States Paper Corporation

The Choctaw chief Pushmataha sat for his portrait in Washington, then caught the "croup" and died.

Pushmataha was buried in the Congressional Cemetery, where American Indian Society tends grave.

In 1916 in Washington, an ethnologist plays song for Mountain Chief, who interprets it in sign language.

Sioux delegation strode along Pennsylvania Avenue toward the Capitol, each warrior proudly wearing a new military uniform, silver epaulets and hat. Tucked in each hatband was an ostrich plume.

The Indians enjoyed visiting Mount Vernon by excursion steamer. In 1872, after an unusually hot spell, two Sioux delegations were delighted to get away from the crowded city. Exhilarated by the river breeze, the Indians began to sing, keeping time by tapping their tomahawks on the railing. At Mount Vernon, George Washington's tomb was the first stop. As the Sioux filed past, several stuck their hands through the iron grating and waved them over the vault. Asked why they did this, they replied: "We are shaking hands with the spirit of the Great Father."

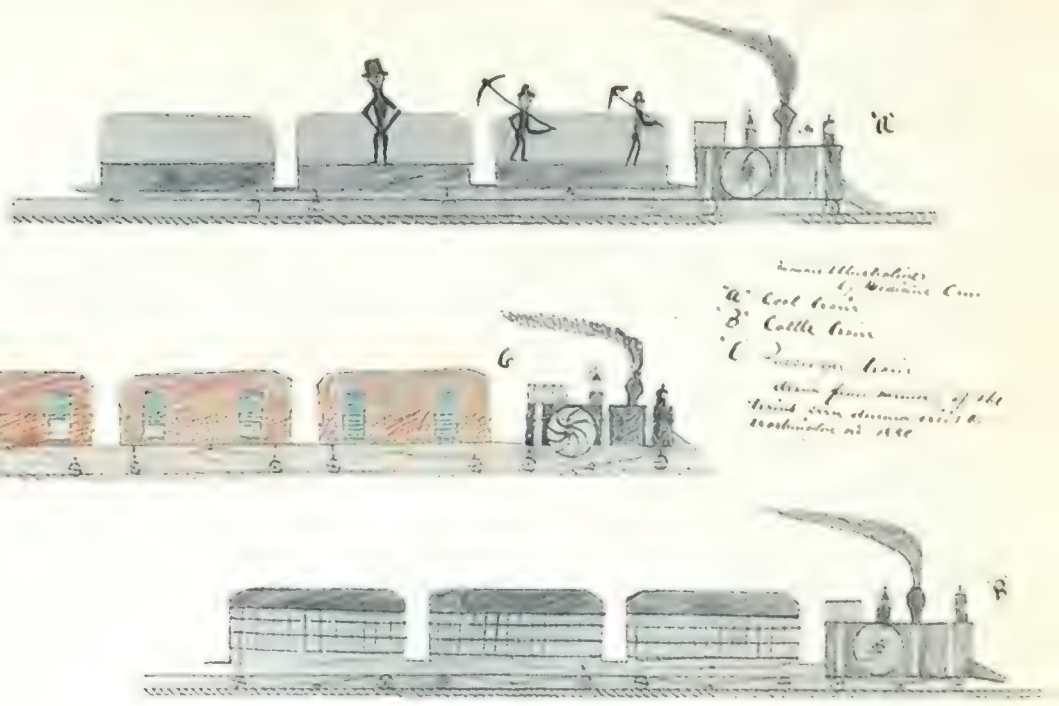
Obviously, the government spared little effort or expense trying to persuade Indian visitors that the white man's way of life was superior. But was the campaign convincing? The experience of the Spotted Tail delegation of 1870 suggests it was not. The Indian agent was instructed to allow the delegates to see and do everything that interested them. "As far as could be ascertained," he recalled, "they did not desire to see anything, and so I selected such places as I thought might amuse and instruct them."

At the Treasury Department, the delegates were fascinated by the great number of young women sorting and counting money. Why did President Grant have only one wife, Spotted Tail asked, when he had so many beautiful women to choose from? Learning that whites insisted on monogamy, the chief decided that, at least in this respect, the Indian way of life was better. The Philadelphia Mint was less impressive. Gold and silver were nice, the chief said, "but I would rather look at pretty squaws."

Unfortunately, the delegation story was touched with dishonor and tragedy. Exploitation and manipulation of the delegates were unconscionable. Both agents and merchants cheated. Shopkeepers charged the government inflated prices for inferior products, while agents and interpreters authorized payment for services and merchandise never received. Agents and interpreters with their low salaries and simple lives were probably as dazzled as the Indians by the glamorous attractions of the East. Resisting the money, clothes and liquor offered by the drummers who hounded the delegations must have taken great strength of character. "It is no easy matter for an Agent to visit Washington and get off whole," admitted a government clerk in 1874. "The town is full of sharks who make Indian delegations and their Agents a summer prey."

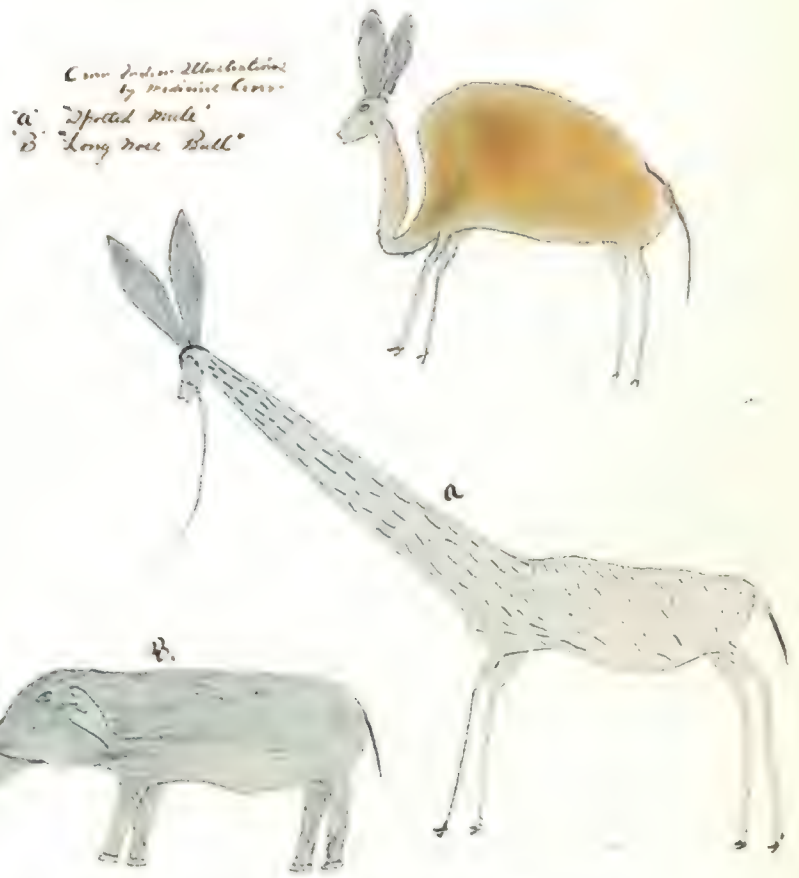
Although the government tried to make the Eastern visits as trouble-free as possible, delegates literally risked life and limb in making the trips. Fatigue and illness were constant companions. Delegations had to meet the challenges of rain-swollen rivers and winter storms, of intense heat and bitter cold. Commercial transportation, when available, offered its own hazards, such as steamboat boiler explosions and overturned stagecoaches. The delegates understood and expected accidents and the caprices of nature. Far more menacing and mysterious were the diseases that claimed so many lives. Measles, smallpox, pneumonia, even the common cold, were serious threats to the Indians, many of whom were elder statesmen of their

Chief Medicine Crow, a Crow delegate of 1880, sketched U.S. Capitol with Indian on dome.



Agency clerk Charles Barstow captioned sketches: here are coal train, passenger train, cattle cars.

At National Zoo, the chief noted "Elk with big back on him" (camel) and "sheep" (probably antelope).



At top is probably a llama. The "spotted mule" is a giraffe and the "Long nose Bull" is an elephant.

"The yellow Bird that runs," left, may be an emu. "Wonder Tail Comes from above," right, is peacock.

tribes. Few delegations returned home without incident or illness, and fatalities were alarmingly frequent.

At least 30 delegates died in Washington. Many more may have perished, but the exact total will never be known. Indian agents were unreliable in reporting deaths, especially those that occurred en route. They reflected the general low regard in which Indians were held. Government officials often worried about the impact a delegate's death might have on the people at home, but many bureaucrats looked on the mortalities as part of the Indian's learning experience. The agent who buried Taza, son of Cochise, wrote that his sickness and death "were not devoid of beneficial results," since they "afforded the Indians with our party an opportunity to observe the civilized methods and customs of caring for the sick and preparing the dead for burial, as well as our funeral rites and ceremonies."

Yet, all in all, Indians did benefit from their Eastern visits. Going to Washington was seldom a once-in-a-lifetime experience. Red Cloud, for instance, made a dozen trips to the capital. With each visit, the Indians became more adept. Most of the tribes eventually developed a cadre of leaders who could master relations with the white man's government. Admittedly, the adaptation was painful and left many of the tribes bereft of land, culture and language. Nonetheless, long years have passed since the bewildered strangers were led by the hand about the capital and its environs.

Tribal delegates to Washington today are as sophisticated and effective as labor unionists and environmentalists. Their lobbyists are successful in having favorable legislation introduced, enacted and funded. As one Indian spokesman so aptly put it, "Before the white man came the Indian had the buffalo and the buffalo gave them everything they needed—food, shelter, clothing. The white man came and took the buffalo away, but he gave the Indians the government and now . . . that is their buffalo."

Earliest known photograph of Indian delegates in Washington was taken in 1857 at South Portico of the White House. Four groups stand in front: Pawnee, Ponca, Potawotomi and Sac and Fox.

Shell Answer Series #25

ENERGY INDEPENDENCE

How to help regain control of our energy future by finding more and using less

By Dr. Sheldon Lambert, Shell Manager of Energy Planning and Economics

Come to Shell for answers

S1

Lift these advertising pages out by removing staples.

You're helping foot the bill for foreign oil. Read on and find out what that's doing to the nation and to you.

If you're like most Americans, you have two real concerns about energy. Are you going to have all you need? And what's it going to cost? The answers, unfortunately, are "maybe" and "a lot".

The main reason for both of these bad situations is simple. We've become dangerously dependent on other countries for our oil.

So unless we do something about it, we'll have to continue to take what they choose to give us, at their price, whether we like it or not.

Q. Why do we have to import oil?

A. Because we use so much of it. Much more than we are currently finding and producing ourselves.

Almost half of all the oil America uses is imported.

Q. What difference does it make where the oil comes from?

A. It makes a big difference. In your pocketbook and in your peace of mind. By getting almost half the oil we use from foreign sources, we're sending the money it takes to pay for all that oil out of the United States. And it's a lot of money. It's equivalent to every family of four sending $1,600 out of this country every year.

When that money leaves this country, it has a real effect on our economy and on you.

This constant flow of money to other countries has already weakened the value of the dollar and helped increase the rate of inflation.

As if that weren't enough, there's also the problem of American vulnerability.

The countries we get oil from could try to influence American policy by threatening to cut off our supply. Such threats cannot be taken lightly. Remember the oil embargo of 1973 and 1974? Those long gas lines? And the overall effect it had on your life?

Every day America spends about $225 million for foreign oil. That's equivalent to every family of four sending a check for $1,600 out of this country every year.

Q. Why not just replace oil with something else?

A. Right now it simply isn't possible. Almost 75 percent of the energy we use comes from oil and gas. Oil alone accounts for 45 percent of America's total energy consumption. Heating, transportation, electricity and more all rely on oil. That's impossible to change overnight. But we have to find ways to develop and use other energy sources because oil is a finite resource. And because we've seen what overdependence on any one energy source can lead to.

Q. What about all those "alternative energy sources" I hear so much about?

A. Enormous technological progress is occurring. Solar power and synthetic fuel are among the most promising alternatives. But unfortunately their successful, large-scale application is years away.

By 1990, direct solar power will probably supply about 1 percent of our total energy needs. We also expect synthetic fuels to contribute about 1 percent by 1990.

Alternative energy sources should be making a significant contribution by the year 2000. That's the good news. But right now, we've got the problem of overdependence on foreign oil.

Q. What can we do until alternative energy sources can help?

A. We can begin right now to find and develop more oil and gas here in America. This will help reduce our dependence on other countries for oil. And increased domestic production can also help us build a badly needed bridge to the next century when alternative energy sources are expected to carry a greater share of our energy load.

It's easy to think of replacing oil with something else, but it's impossible to do it quickly. Oil is used not only for transportation, but also for electricity, clothing, cosmetics and much more.

Q. If finding more oil and gas in America can help, why don't we get on with it?

A. As much as ⅔ of our oil and gas that is still to be found lies under public lands onshore and off which are controlled by the Federal government. This 1.3 billion acres equals about 44 percent of the entire United States land area.

Unfortunately, much of this land is off limits to oil and gas exploration and development because of a multitude of laws and regulations.

Today public lands account for only 17 percent of our oil and gas, but they could account for a lot more.

Q. Wouldn't exploring for oil on public lands "foul up" the environment?

A. No. Oil and gas production, onshore and off, has been going on in America for decades. With virtually no adverse effect on people's lifestyles, wildlife or scenic values.

Shaded areas are mostly government controlled. Both onshore and off.

The Alaskan Pipeline shows how energy and the environment can live in harmony. Today, caribou graze alongside the pipeline while people throughout the United States enjoy the benefits of domestic energy.

Q. Why can't the oil companies look for oil someplace other than public lands?

A. We are looking and we've found a lot. But much of the oil and gas that's *not* on public lands has already been found. That's why finding out how much oil and gas is on public lands is so important. Most experts think they may contain huge reserves, as much as we've already produced. If we *aren't* allowed to develop them, America will *not* reduce its overdependence on foreign oil.

Q. Why not just use more coal? We've got plenty of that.

A. The United States has enough

coal to last at least three hundred years at the rate we're using it now. In fact, we've got so much, we could even become a major coal exporter.

Unfortunately, concern over mining coal, transporting it and burning it cleanly is keeping us from using as much coal as we need.

Q. But coal means strip-mining. Doesn't that ruin the land?

A. No. It's now possible for virtually all strip-mined land to be returned to its former use. But governmental regulations are preventing many of our richest coal deposits from being developed as fast as they could.

We must find a proper balance between the environment and the economy if we're to really use coal to help us get out from under the thumb of foreign oil.

Q. Can't conservation solve our energy problems?

A. Not by itself. It will help save energy and money. And if we don't conserve we'll make our problems even worse. But conservation alone won't be enough to make us less dependent on foreign oil. Here's why.

In 1990, America will have about 21 million more mouths to feed. We'll have about 18 million more pockets

Would you strip-mine this beautiful land near Cadiz, Ohio? Shell already did and returned it to full productive use.

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to fill with a paycheck. To allow for this growth and the resulting energy demand, we'll have to combine conservation with increases in domestic production of oil, gas, coal and nuclear. Conservation alone isn't enough.

Q. Why should I take your word on energy? You have a vested interest.

A. Right. But Shell is actively involved in efforts to help reduce our dependence on foreign oil. In 1980 we spent over $2.2 billion on energy-related activities here in America. From Alaska to the Gulf of Mexico we're exploring for oil and drilling more wells than any other year in our company's history.

Technology is important, too. We spent $73 million last year on energy-related research and development.

Find out more about the energy situation, oil, gas, and alternate energy sources from others who you feel would be objective. Like the following:

Energy and You
A publication of the Department of Energy.

Write: Energy, Box 62
Oak Ridge, TN 37830

The Energy Puzzle, How You Fit In

Write: Alliance to Save Energy
1925 K Street, N.W.
Washington, D.C. 20006

Home Energy Conservation

Could your home become more energy efficient? About ⅔ of the energy used in most homes is for heating and cooling. Photos 1, 2, and 3 show simple do-it-yourself methods of reducing heating and cooling costs.

Apply caulk in cracks and around windows and outside doorframes. Cost for the average home, about $10.00 to $17.00.

Weatherstrip doors. Strips of metal, rubber, foam or felt can be used. Cost, about $4 to $10 for each door.

Q. What can we do to solve our energy problems?

A. Find more energy here in America and use less of it. Finding more doesn't just mean oil and gas. We have to make better use of coal. We have to build and operate more nuclear plants. We have to produce more energy from oil shale. We have to find more ways to use solar energy and more ways to make synthetic fuels, too.

But just finding more energy won't do the job unless we also use a lot less.

Self-sufficiency was once a longstanding American virtue. And one that conservation can again help establish. Driving less and putting insulation in the attic are powerful moves in the right direction.

Using less also means rethinking how we build and use our homes, schools, factories, office buildings, appliances and automobiles. We have to keep in mind that conservation means consuming less energy and using the energy we consume more efficiently.

Conservation must become our new standard of quality.

Q. What can I do to help reduce our dependence on foreign oil?

A. You can continue to conserve energy and use the energy you do consume more efficiently. Both will save you money. But there's more.

You can help spread the word that energy and the environment can coexist and that public lands should not be put off limits without first determining their resource potential.

You can let your friends and neighbors know how you feel about the need for energy development.

You can always keep in mind that energy decisions made today will have profound effects on you and your children's future.

It is estimated that you can save 1% to 2% on your heating bill for every degree you lower your thermostat in winter.

4
Shell Answer Book 22
THE HOME ENERGY-SAVING BOOK
Some simple ways to help you save up to 50% on home energy.
Come to Shell for answers

For more energy- and money-saving tips, write for Book 22, The Home Energy-Saving Book. See address on back cover.

Q. What if I don't believe in your solutions?

A. Then support the ones you do believe in. America's energy problems are too important for anyone to remain silent or passive about them. Speak up on the energy solutions you think will help.

Q. How can I learn more about our energy problems and solutions?

A. Send for the information pointed out on pages 6 and 7. And watch for more Shell Answer Books.

They'll be in magazines in the months to come. And they'll be available free at participating Shell dealers.

If you'd like extra copies, or if you have some questions on energy that you'd like answers for, write me, Sheldon Lambert, Shell Oil Company, P.O. Box 61609, Houston, TX 77208.

About the Author

Dr. Lambert is Shell's Manager of Energy Planning and Economics. He joined the company in 1958 after receiving his Ph.D. in physical chemistry from Ohio State University. His corporate and academic accomplishments are many, including 30 technical papers, contributions to textbooks, and serving on numerous national committees and task forces.

Find more Use less

The actions America takes on the energy front in the months and years to come will have a profound effect on jobs, the economy, national security and even your standard of living.

America has the people, the resources and the will to regain control of our energy future. The only thing that stands in the way of this is the lack of a national consensus on just how we should go about it.

Knowing more about America's energy problems will make it easier for you to support the solutions you believe in.

Shell believes the solution to America's energy problem is to find more and use less. ©1981 Shell Oil Company

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Produced with major funding from the Shell Companies Foundation, Incorporated.

By Janis Carter

A Journey to Freedom

On a remote island in the Gambia River, an American graduate student teaches captive-reared chimpanzees how to survive as wild animals

Janis Carter drives chimps 170 miles to new home.

Morning came much too soon. With a thousand things yet to be done in preparation for the move, I had spent the entire evening chasing Lily through the bush, trying to persuade her to join Dash and Lakey, who were riding in a bed of leaves in the back of Felicity, my 22-year-old Land-Rover. Lily was not so easily convinced. Early the next morning, I climbed behind the steering wheel, with three warm bodies attached to mine. We departed with Lakey riding on my lap clutched to my stomach, Lily perched on my shoulders, legs draped around my neck, and Dash seated next to me with his arm tightly looped through mine. The chimps anxiously peered out the windows watching the African villages and vegetation of The Gambia pass by.

Although I had taken the chimps on short excursions to familiarize them with the vehicle, this trip was to be a long one. Our journey was 170 miles over bad, mostly unpaved roads, and it was close to eight hours of hot, dusty driving before we began to wind our way to the river's edge. Crawling out of the vehicle, we stood facing a group of islands recently designated as The River Gambia National Park. The use of the largest, Baboon Island, had been made available to the Chimpanzee Rehabilitation Project. The director of the Wildlife Conservation Department, Eddie Brewer, was waiting and transported us by boat across the river to the tip of the 1,200-acre island where my camp had been set up only a few days earlier. Estimates for a chimp-proof house had been far above my means, and as the day of the move approached I was still without a place to live. A British Army squadron was in The Gambia on bush maneuvers and, hearing of my plight, had kindly constructed a cage of scrap materials for me—my new home. From the beginning the chimps would have to accept that I alone lived in the cage. While allowing me to be close by at all times, the cage eliminated the distraction human objects could present, allowing the chimps to focus more fully on being chimps. Although not an ideal home, at least it would protect my possessions from the curious, manipulating fingers of my companions.

Janis Carter's cage on Baboon Island is the only place chimps aren't allowed.

As I watched the boat disappear from view, I felt a stab of fear and loneliness. Although we had spent the last 18 months living in the Abuko Nature Reserve, taking daily walks in the forest, the unfamiliarity of this new jungle was a bit overwhelming. I knew that if the chimps' return to the wild was to be successful, I too would have to limit my contact with humans. My always precarious finances deprived me not only of most conveniences but also of a radio, the only means of contact with the outside world. We were now totally alone.

The weight of clinging bodies reminded me, however, that there were others possibly more afraid than I was. For some odd reason, I found this comforting. Nervously clutching each other, we made our way off the pier. As it grew dark, I slipped into the cage, and collapsed into bed, exhausted, with my soiled clothes still on —a practice soon to become a habit.

As I lay in bed, reviewing the day's activities, I heard the low grunts of a hippo, followed by the cries of a hyena, both relatively close. Although it was the dry season, I felt a splatter of water fall from above, and heard alarm calls from the chimps, who had curled up on the cage directly above me. After each wild animal call, the chimps awakened; their startled reaction was to urinate and defecate. No matter how many times I moved my bed and mosquito net the chimps relocated directly above me.

When I awoke the following morning, there was tangible evidence that all was not a dream. I was lying in urine-soaked sheets and clothes. Looking up, I saw three chimps, entwined, fast asleep with my mosquito net as a cushion. As I washed out my only sheet in the river, I began to wonder if this would ever feel like home.

Dash, Lily and Lakey were the first of a group of nine captive-reared or young wild-caught chimps that I would eventually release on the island.

It all began with Lucy. Born in captivity, Lucy was taken from her chimp mother when she was two days old and reared as a human by Maurice and Jane Temerlin. Lucy was the subject of an experiment to determine how a chimpanzee would develop if reared in an enriched human environment. At five she became a student in the Language Acquisition Project, then led by Dr. Roger Fouts at the University of Oklahoma. In this project chimpanzees were taught to communicate in the American Sign Language of the deaf, and Lucy eventually built up a vocabulary of more than 100 words. I first met and began working with Lucy when I was a graduate student in psychology taking part in the language project.

At 11, Lucy was considered a young adult, and her human parents were faced with a critical problem that most exotic animal owners eventually confront. As captive chimpanzees approach puberty, they often become unmanageable. Outgrowing their usefulness in many

'Many confiscated chimps arrive sick, emaciated and physically abused'

research projects, laboratory chimps are relegated to a life of confinement. The options open to home-reared chimps are few: zoos, research facilities or euthanasia. Their humanized upbringing and the trauma of separation from their human family are severe disadvantages if they are to adjust to a new environment.

As an infant Lucy's needs were satisfied by her human family, but as she matured they were no longer able to fulfill all her emotional and physical requirements. The human home became an unsuitable environment. With a life expectancy of nearly 40 years, she would, with good health, outlive her human parents and face an uncertain fate. The Temerlins wanted to offer Lucy more than a future in the confines of a cage.

To prepare for the transition, Lucy was joined by a young female chimp born and raised at the Yerkes Regional Primate Research Center (SMITHSONIAN, September 1973 and July 1978). Marianne's presence in the Temerlins' home gave Lucy the opportunity to interact with another chimp, her first long-term relationship with a member of her own species. I had spent a year working closely with Lucy so I could also help.

It was at this time that the Temerlins and I became aware of a unique project in Senegal run by a British woman, Stella Brewer. For several years she had been training and releasing young orphaned chimpanzees in Niokolo Koba National Park. Although Stella Brewer had never attempted to release a chimp with Lucy's background, her success gave us an incentive to try. Aware of the risks involved in releasing an adult human-reared chimp, yet mindful of the alternatives, the Temerlins made arrangements for Lucy's trip to Africa in 1977. To provide Lucy with emotional support during and after the move, the Temerlin family and I accompanied her and Marianne.

Within a few weeks Lucy's human parents returned to America, leaving Lucy, Marianne and me, three neophytes in wild chimp behavior, to begin our new life in Africa. We would live in the Abuko Nature Reserve for the next 18 months before moving to our final destination on Baboon Island.

During this period, as the three of us acclimated to African life, other chimpanzees arrived and our group slowly began to grow in size. These chimps came from various sources. Some were home-reared, some caught in the wild by illegal traders and then confiscated by the Gambian and other concerned governments. Originally I planned to stay only for a short time to help Lucy adjust, but now, nearly four years later, I am still working with nine chimps and using the research aspects of the project for my PhD dissertation.

Janis reassures the Holland chimps during an early walk in Abuko.

Lucy communicates by signing with her mentor. They have emotional bonds dating back to the months they spent together at the Temerlins' in Oklahoma.

Though one of the smallest African countries, The Gambia is one of the most progressive in wildlife conservation. In 1977, Gambia's president, His Excellency Sir Alhadji Dawda Jawara, proclaimed a ban on the capture or trade of all wild animals. Because chimpanzees disappeared from that country in the early 1900s, Gambian officials are most anxious for the Chimpanzee Rehabilitation Project to succeed. Though the Gambian Wildlife Conservation Department stopped most of the animal trade, some animals are still illegally brought into the country. Several of the chimps confiscated by officials have been channeled into my project.

It is the infant chimp that is most highly sought after in the primate trade. No matter what method of procurement is used, the end result is the same—separation from the mother at a dependent and vulnerable age. The trauma of capture, improper care and primitive travel con-

ditions are stressful and debilitating—if not fatal—to the infant chimp. Many of these confiscated chimps arrive sick, emaciated and physically abused. The first arrived in 1978.

Dash was captured in the wild, at about age four, in Guinea and illegally brought into The Gambia and sold as a pet. Within a month he was in a veterinary clinic suffering from pneumonia. Dash was confiscated and needed months of medical and psychological care before rehabilitation could even begin.

Lily was wild-caught in Zaïre when she was about two-and-a-half years of age. Though intended for the pet trade, she was in poor physical condition. Taken in by a sympathetic American couple and nursed back to health, she lived with them in relative luxury for two years. Late in 1978, when the couple was transferred, Lily was brought to The Gambia to join the project.

Lakey came in a tiny basket

Lakey, like Dash, also was wild-caught in Guinea. A few days later, Lakey's captor tried to sell her in a village only a mile from the Abuko Nature Reserve. She was confiscated quickly and brought to me in a tiny basket.

Karen, Marti, Geza and Kit were captured in Sierra Leone. Destined for circuses and zoos in Mexico and Spain, they were confiscated in transit in Holland. Donations from Dutch citizens subsidized the chimps' return to Africa. These chimps would be ideal candidates for rehabilitation; their age, wild experience and good physical condition would be assets. After their acclimatization in Abuko, I would gradually introduce them to the island. Lily, Dash and Lakey would be the first to go, followed by Lucy and Marianne. The Holland chimps would be the last to move.

Marti clings to another Holland chimp after arrival in Abuko. They had not been free since they were captured and their mothers were slain in the wild.

Other chimps would not be so lucky. In early 1978, a five-year-old female chimp, Menchen, was brought to the reserve in a small basket. Her body was folded over at the waist, her arms and ankles bound with wire to hold her in a permanent fetal position. Each hand was bent back and the digits wired to the wrist. The wire was so tight that eventually a thumb and finger were lost. Her body was covered with oozing infection, her black hair matted with blood. After months of intensive medical care, Menchen recovered the use of her hands and managed to escape before her scheduled release to a protected area. Her mistrust of humans was understandable.

Wart, a young male, was confiscated in late 1980 in The Gambia while in transit to another country. He arrived gaunt, with severe diarrhea resulting in dehydration and near paralysis. Trauma and mistreatment were evident in his total rejection of contact with and comforting by humans. In spite of care and attention, within weeks Wart's young life ended in a cage. I am still haunted by the look in his eyes, reflecting the misery and pain of his recent past. Though sad, Wart's death was not unusual. It has been estimated recently that between eight and ten chimpanzees die for each live specimen reaching its destination.

Chimps experience a lengthy childhood. The mother-infant bond is one of great intensity and long duration. Independence develops slowly. The bond between mother and young persists even after the offspring reaches social matu-

'I would climb a low branch, tear off young leaves and eat them voraciously'

rity—13 to 15 years of age. This long period of dependence is necessary to insure the learning of the skills and behavior patterns necessary to function successfully as an adult. The infant acquires much of this vital information through observation of the mother and other members of the social group.

Captive-reared and young wild-caught chimps are deprived of this opportunity to learn. When released, someone must teach them and serve as a model for behavior. I hoped that in time these chimps would gradually gain the knowledge for survival through observation, imitation and practice.

Before their release on Baboon Island, the chimps needed to become familiar with the climate, wild foods, and in some cases communication with members of their own species. The Abuko Nature Reserve was the initial training ground. As the reserve was open to tourists, the larger and potentially more harmful members of the group lived in a spacious outdoor enclosure. Their experiences were limited to what I could simulate within this cage. Under my supervision, the younger chimps were allowed free movement during the day and protective cover at night in an enclosure separate from the older chimps.

During our walks in Abuko and later on Baboon Island, I tried to replicate as much as possible the daily routine of wild chimps. Training focused on basics such as recognizing food sources, building nests and avoiding predators, including crocodiles, pythons and leopards. With myself and the more experienced chimps as models, those chimps lacking a particular skill or behavior pattern soon emulated our actions. I could not force them to engage in new activities, so all their learning had to occur as naturally as possible during our daily routine of foraging and exploring the environment.

One of the most basic skills is that of natural feeding. For those animals raised in captivity, the adjustment to a diet of plants and insects is a long, slow process. But as Baboon Island also supports three other primate species, there is competition for food. I had to prepare them for eating green fruits, as well as leaves, stems, flowers and bark. A chimp's known reluctance to try new foods further compounded my problems.

Early in the program, Marti eats orange; later he'll learn to forage for wild food.

The chimps could not be forced to try new foods. To motivate them, I served as a model. As we walked through the forest, I would spot a tree sprouting fresh new leaves and begin to give food barks as we approached, directing the chimps to the food source. If the food was unfamiliar, the group reaction was to wait for my lead.

Trying my best to give a convincing performance, I would climb a low branch, tear off young leaves and eat them voraciously, while emitting satisfied food grunts to assure the chimps that this was a good food. For the wilder chimps this was usually sufficient to stimulate their interest, and they would climb up above me, devouring leaves as they went. The home-reared chimps were harder to convince. Curious, yet hesitant, they would all sit cramped close to me, arms around my back, inquisitive faces almost touching mine, watching as I filled my mouth repeatedly with bunches of leaves. Lily, in particular, had great difficulty adjusting to leaves as an essential part of her diet. When I swallowed a mouthful, Lily would open my mouth and inspect for remains. The next time I would encourage her to join in by passing already chewed food from my mouth directly into hers, as chimps sometimes do, particularly mother and infant. I was exhilarated when she first accepted the food—and

Although their earlier years had been spent in the wild, their insecurity and fear of sudden freedom are apparent as Holland chimps cling to each other.

then dismayed to watch her spit it out and walk away in search of ripe fruit.

It was almost eight months before Lily finally ate her first kenno leaf—a leaf the wilder chimps immediately recognized and consumed. In the following months, even after the chimps were released on the island, whenever we ran upon a new species the first response of many of the chimps was to bring a sample to me, as if in request of a test run.

Because her first 18 months in Africa were spent in a cage, Lucy's foraging experiences were limited. At Abuko I collected the same wild foods that the younger chimps were eating on our walks and offered these to Lucy in her cage. Although slow to accept the wild foods, she eventually did. All of the chimps were given generous food supplements in the beginning until I could determine whether there was adequate natural food present. I gradually cut back the supplement as they increased their foraging abilities. Once released on the island, Lucy lagged behind at first. Although she had accepted many of the wild foods, she seemed unwilling to gather them herself.

Teaching Lucy to fend for herself

Many of the foods on the island were high in the canopy and out of my reach, so it was difficult for me to serve as a model for Lucy. To encourage her to develop her foraging abilities, I had to bring the canopy down to her. Late at night, when all the chimps were asleep, I crept out and tied clusters of ripe fruit to low tree branches in the hope that Lucy would see them and take a more active role in feeding herself. The next morning I led the group to the area and gave loud food barks, pointing to the food source for Lucy's benefit. This repeated episode made Lucy more aware of her environment; it became a bit of a game to try to locate the food each morning.

The baobab tree proved to be a major food source for the chimps, and they began to eat its fruit, flowers, bark and leaves. Although Lucy had some climbing experience, she had difficulty with the thick-trunked baobab. So she would sit under the tree and wait for the cast-off food of the other chimps. She grew to like the leaves and flowers so much that when she watched the others from below, she began signing to me to help her. She signed MORE FOOD, YOU GO, pointing to the others who were devouring the tasty food.

On one of their early walks in Abuko, Lily and Dash tentatively investigate their new environment; they spent nights in a large cage.

I am not an adept climber myself; moreover, it was Lucy who had to learn actively to gather her food, not me. I communicated NO, and showed her an alternate route up a neighboring tree, from which she could then leap across to the baobab. This did not appeal to her and she persisted in her efforts to get me to help her. She led me by the hand to the tree base and placed my hands on the trunk as she repeated MORE FOOD, JAN GO. As a final attempt to assist her without actually gathering her food, I returned to camp with her close on my heels. There I had a large piece of construction timber, which I started dragging back to the baobab tree site. Lucy seemed to anticipate my action and helped me take the timber to the tree, where she immediately propped it up against the trunk, giving her access to the food. With more experience Lucy can now locate trees with easier access routes.

The other chimps have needed different types of stimulation. They were unable to search for certain foods if they

'I heard an unfamiliar high-pitched scream followed by a cry I recognized as Lakey's'

did not know where they were available. Rather than disturbing their natural behaviors, I set up situations that exposed them to different resources. After confirming that the chimps would eat birds' eggs, during the night I positioned abandoned weaver bird nests filled with eggs along our daily route. Once they observed the eggs in nests, they became more alert to this new food source. Indeed, they eventually did seek out appropriate areas for birds' eggs.

Insects, particularly ants and termites, are important in a chimp's diet. I had read extensively about how chimpanzees fish for ants, and had been rehearsing for my own debut as an insectivore. But while I was perfecting my skill, Dash initiated the behavior. One day Dash, Lily and I encountered a wide stream of safari ants. I watched as Dash stopped, spontaneously broke a stem off a nearby bush, cleaned it of leaves and very nonchalantly inserted the stem into the nest hole he had located. When he withdrew the stem it was covered with ants—which he quickly gobbled up. His four years of living in the wild had paid off. Lily and I watched, staying back so that the safari ants could not bite us.

Watching satisfied both Lily and me that first day. During the following days, Dash did not seem to seek out the same ant nest, but if we passed one he was always very quick to make and use a tool. Somewhat nervously, I finally decided to join in, hoping that the combined example of both Dash and me anting would induce Lily to try. Inserting the stick into the nest results in soldier ants storming out in defense; it is necessary for the predator to snap down quickly on the ants to avoid a painful bite. My tools never seemed as strong or durable as Dash's and my movements were not nearly as fast. As quickly as I could I jabbed the ant-clustered end into my mouth, snapped my teeth down tightly, and began chewing and swallowing, consciously trying to cover my fear of being bitten with a smile so Lily would be more likely to join in.

In a few days, Lily's curiosity took over and she edged closer while Dash and I were fishing for ants. In her first attempt she failed to imitate properly the use of a tool. Lily stuck her finger directly into the ant hole; I winced as she shot up in the air with a shriek, and I hoped that she would overcome this painful experience. One day as Dash finished anting, Lily picked up one of his discarded tools and, holding it too close to the tip, inserted it fist-first into the hole. I witnessed the pain of her second failure.

Lily was not, in fact, a slow learner. In the wild this skill takes many years of observation and practice before proficiency is reached. Lily's wild education had been interrupted when she was two-and-a-half, and it is quite possible that she had observed her mother fishing for ants but never actually performed the task herself. Later, Lily and six others learned the appropriate technical skills for acquiring ants from arboreal nests, a rather precarious and demanding feat.

Wild chimpanzees are known to kill and eat mammals. Although I had successfully served as a model introducing various plants and insects to their diet, teaching them to pursue and capture a mammal was simply beyond my capacities as a tutor. I hoped for a natural emergence of predatory behavior.

An unexpected and painful kill

In September 1979, about six months after the initial move to the island, a lone female red colobus monkey appeared close to camp. Forming a circle, the chimps successfully cornered the monkey. Dash moved in for what appeared to be an attack, fell short of his target, and the monkey escaped. This same event repeated itself over the next few months, as the colobus became a frequent visitor.

One day as I was scanning the canopy with my binoculars, my attention was drawn to an unusual scene. As I focused to get a clearer view, I saw Lakey and the colobus monkey grooming each other. It has been reported that young wild chimps sometimes engage in friendly interaction with members of other primate species, but this was definitely a first for my group. For the next few days I paid close attention to the developing relationship, noting an increase in physical contact that finally led to their actually sleeping within a few feet of each other. It was only two days later that another, more aggressive, form of interspecies interaction took place.

Early one morning as I was getting ready to leave my cage, I heard an unfamiliar high-pitched scream followed by

During some rare free time, Janis presses dried plant samples to send to the Smithsonian Institution and to the University of Tennessee for study.

Janis passes fruit from her mouth to Lily's in order to introduce a new food.

a cry I recognized as Lakey's. I ran from my cage to the scene of the commotion to find Marianne, blood on her forehead, holding the colobus monkey by the tail. Lakey was clearly hysterical, screaming to the point of choking herself. With her small outstretched, upturned hand, she was using a common begging gesture for me to intervene. She began to tug on my shirt, her stare fixing alternately on Marianne and me.

My initial reaction was to reprimand Marianne, but the look in her eyes disquieted me. I returned to the cage, grabbed the only means of protection I had, a low-power BB gun, and raced back. All eyes were on me as I raised the gun to threaten Marianne. Looking from Lakey's pleading face to those of the rest of the group, I realized that I might be making a mistake.

The chimps were sensitive to my lead and this situation was no different. Predatory behavior occurred only infrequently and it was crucial that I handle it correctly. How could I even consider interfering with the development of a natural behavior that could function in the chimps' survival? I ran back to my cage, exchanged the gun for a camera, and returned to document the event.

Within moments Marianne began the kill, viciously swinging the monkey by the tail, bashing its head against a tree trunk. Many of the chimps became excited, screaming, swaggering and throwing sticks. To my amazement, as the scene reached its climax, little Lakey joined in. Once the colobus was dead, Marianne began to tear off and eat the flesh. She did not in fact share it with the others, although she allowed them to touch and inspect the dead body with sticks. Marianne was always selfish with any object to which she had primary access. Once she finished, the day continued the same as any other for the chimps. Yet an immense step had been taken in their development as wild chimpanzees.

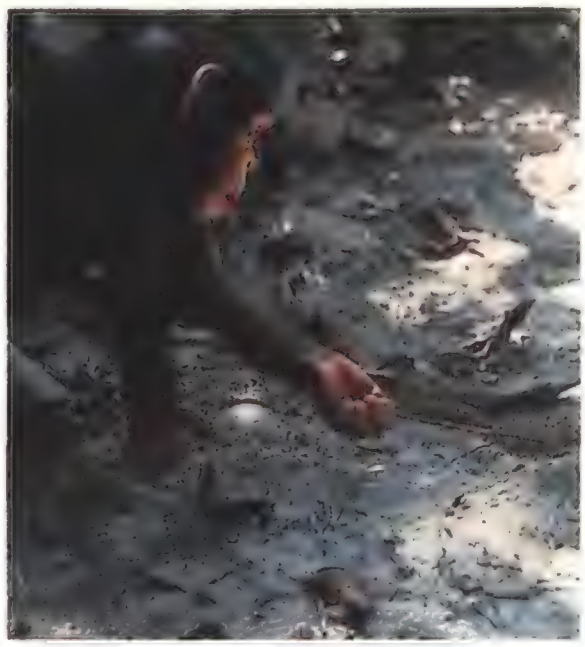
During my months on the island, I often longed for someone to assist in the care and observation of the chimps. My days were always full, beginning before dawn and ending in the early evening when the chimps climbed into their nests. After an exhausting day I would spend only an hour reading or writing by kerosene lantern before retiring. Each year it was necessary for me to return to the United States to raise funds for the project. Without an assistant, I had to leave the chimps alone. I tried several times to introduce a new person into the group, but the intense loneliness, lack of emergency radio contact, primitive living conditions and monotonous diet of rice and sardines were not attractive to a newcomer. Moreover, the presence of humans other than myself caused disruption both gross and subtle in the chimps' behavior. As the chimps grew physically and their group structure took form, they became aggressive toward the human intruders.

Their earlier negative contacts with people could have been contributing factors. Wild chimps threaten but stop short of physical abuse; yet even my years of close contact with the chimps did not exempt me from physical challenges—particularly after each lengthy absence. When I returned, I was open to aggressive attacks by the older chimps as I tried to reintegrate and regain my earlier position. The larger chimps sometimes hit me and once Marianne threw me against a tree. Though gradually I have become a less dominant figure, I do need to retain a certain degree of respect, to safely carry my binoculars and notebook, and to travel with the group.

One of the most difficult challenges I faced was teaching the chimps to build sleeping nests of leaves high in the trees as wild chimpanzees do every night. It takes young wild chimps several years of observation of their elders to learn to construct a nest.

In Abuko, the young chimps had protective shelter at night, so their only experience with nesting occurred prior to capture and during our daily walks. We had spent several months making day nests on or near the ground, using the same construction technique that they would later use high in the trees.

Once we were on the island, my cage represented security. They rested on the roof because they could be close to me and also because it was "easy." To encourage more appropriate nesting behavior and keep myself and belongings clean, I covered the cage top with sheets



Safari ants inflict painful bites, so Dash uses stick to gather them for food.

Janis supplements food the chimps find with netto fruit, mangoes, oranges.

'I felt hairy bodies, one by one, slowly and quietly squeeze onto the tiny sleeping platform'

Lucy, who spent only two days with her own mother, is affectionate and comforting to her adopted son Marti, one of the young male Holland chimps.

of corrugated metal. I had no idea the roof would prove even more of a headache. The chimps were immediately attracted to the new roof, and each morning began with the incessant and almost unendurable sounds of their feet stamping and pounding on the metal sheets. After several days I put thorny branches all over the roof, thus removing their sleeping site and forcing them to go up trees to find private nesting sites. It worked.

The young chimps had been nesting regularly on their own for several weeks when Lucy and Marianne arrived. Prior to their arrival, wooden platforms were constructed ten feet above the ground less than 20 feet from the cage. I hoped that Lucy and Marianne would choose these sites rather than the ground for sleeping. The younger, wild-caught chimps had at least two years' experience observing nest construction and sleeping in trees with their mothers, but Marianne and Lucy lacked such experience. I was soon to find that elevated nest building was not an easy concept to instill.

Marianne pulls at tail of red colobus monkey during group's first mammal kill.

Lucy's first night on the island proved difficult. She desperately wanted to come into the cage with me, so she sat next to the wire, signing and crying. After some time she deliberately but very delicately removed some of the thorn branches from the roof, managing to clear an area large enough to sleep on. I realized her need for security, but at the same time there were four other chimps following her lead. Lucy's lack of interest in the sleeping platform was obvious. I was determined to change her mind the following day, so I wired the thorns securely to the cage. That night, as dusk neared, I dragged some branches up to the platform and began making a nest, giving satisfied grunts while totally absorbed in my activity and ignoring the others. Lucy watched from her position next to the cage, and the others peered at me over the sides of their nests high above. Lucy finally climbed up to share my bed. After an hour together, I tried to slip away. Lucy followed.

It was clear that if I was going to have any influence I would have to spend the entire evening on the platform. But when I did, I felt hairy bodies, one by one, slowly and quietly squeeze onto the four-by-four-foot platform. Within an hour after dark, six of us were packed on the platform—all pushing, pulling and fighting for enough comfortable space.

I spent the night swatting mosquitoes, struggling to stick with my new strategy. I let the others join us for several days until I was convinced that Marianne and Lucy were comfortable with the platform. I then attached thorns to the major portion of the platform, allowing only enough space for two bodies, Lucy's and Marianne's. Then I made a small nest for myself in an adjacent tree, purposely uncomfortable so Lucy would not be encouraged to leave the platform. I waited. Since there was no longer any room on the platform, the other chimps went high into the trees and relocated new nests for themselves.

Lucy and Marianne used the platform every night during the following months. Each evening I would provide them with nesting materials so they would form a functional nest. If I left precut branches on the ground they would, with coaxing, take their own materials to the platform.

I expected that, as the group became more familiar with the island environment, it would range farther from camp and Lucy and the others would sleep farther away. Although Lucy was ingenious, I did not think she would be carrying her platform around to new areas. So, after eight months, I decided it was time to take the platform down and test Lucy's and Marianne's ability to select an appropriate nesting site. I removed the platform at midday and impatiently waited to see what they would do. The next morning I found Lucy, Marianne and Marti lined up in a row along the tree

Lucy, Marti and Marianne sleep on the trunk of tree ladder instead of building nests. Janis found teaching nesting habits was easier said than done.

trunk that once supported the platform. Each was on a rung of the tree ladder, leaning against the trunk fast asleep.

I decided the transition from the platform to a natural nest needed to be more gradual. My next step was to construct an artificial tree fork in the same spot and induce Marianne and Lucy to sleep there. In time this, too, was accepted. After months of their consistently choosing this site over the ground, I removed the ladder rungs and then the tree fork. Again, my failure repeated itself, only it was worse. Now, Lucy and Marianne began sleeping on the ground. I was growing desperate and running out of ideas.

At about that time, a near tragedy forced me to realize how urgent proper nesting had become. One morning I found Lucy with her eyes so swollen she couldn't see, a high fever, and the glands behind her ears as large as baseballs. Although, alone, I had dealt with several emergency situations and illnesses over the years, these symptoms were not familiar. I decided to go for help. I left for Banjul in the hope of finding a doctor or vet who could make the trip back with me to observe Lucy and diagnose her problem. The doctor would have to work from inside the cage; otherwise, as an outsider, he would face possible attack by the chimps.

Arriving in the early evening at Banjul, I located a volunteer vet who informed me that Lucy's symptoms were most likely caused by a spitting cobra, and that there was nothing to do but wait. I raced back the 170 miles through the night, crossing the river in the early morning hours, trying to reach camp before the chimps left on their daily foraging, which would leave Lucy alone, blinded. When I arrived I found the entire group clustered around Lucy, who was lying on her side, still feverish and unable to see. It was four days before the swelling subsided and she was able to see again.

Lucy's accident was an added incentive to get all the chimps nesting in trees, for spitting cobras are ground dwellers. One evening shortly after Lucy's recovery I set my alarm for midnight and fell asleep. When the alarm woke me I slipped out of my cage and began searching for Marianne and Lucy. With the light of the full moon I was able to locate them easily. I found Marianne curled up in a tree hole, an ideal spot for a snake. Lucy was stretched out flat on her back in an open area. I woke both of them and scooted them up trees. Two hours later, I repeated the search, finding them again in the tree hole and on the ground. I repeated this two-hour vigil each night for six consecutive nights until I was so tired I could not keep up with the group when they foraged during the day.

It was obvious that the persuasive technique was not going to work. My last tactic was to instill a more natural fear of sleeping on the ground. I set the clock again for midnight. I trudged out of the cage and located Marianne and Lucy in their respective areas. I very quietly crept up to each of them and, grasping a piece of skin with a pair of pliers, pinched them. I hoped to simulate the bite of an animal and thus frighten them in a realistic manner that they would remember. Success at last. In a week, both were sleeping in trees.

Lucy's strong emotional attachment to humans not only complicated her nesting adjustment but was also an obstacle to her integration with the group. It was a great benefit to her early learning in Africa, but from the outset of the project my goal was to lead the chimps to self-sufficiency and independence. In order to adjust successfully to my permanent departure, the chimps, in particular Lucy, would have to seek each other out for emotional and physical comfort.

It was an extremely painful task to ignore Lucy when she requested attention, both because of her obvious strength in forcing her desires upon me, and because of our intense past bond. Nevertheless, it was only by denying her my attention that I could get her to seek the company of chimps and realize her needs could be met by them rather than humans.

Shortly after the Holland chimps arrived in 1979, my burden was lightened. I introduced two of the young males, Marti and Geza, both age three, to the group. Marianne and Lucy were cycling females at the time, and each adopted a

Marianne, whose own mother abused her babies, adopted young Geza as her own.

'As I entered my cage, Marianne let out an alarm and I saw a cobra not a foot away from me'

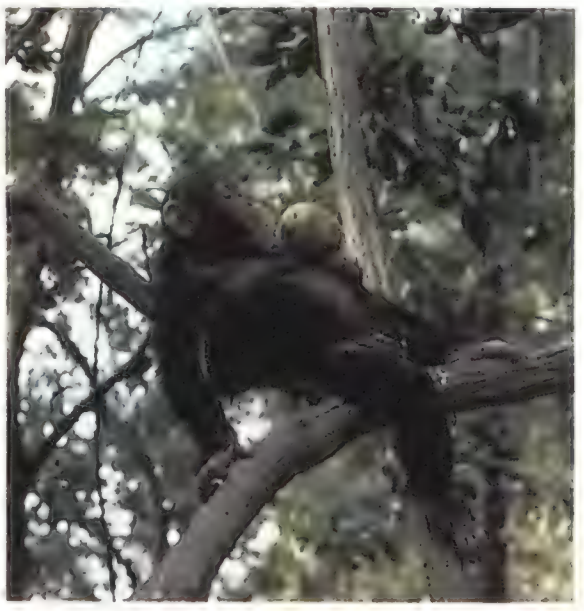
young orphan within a short period. This exceptional event fulfilled needs on both sides. Neither Lucy nor Marianne had experienced the care of a chimpanzee mother. Although Lucy had been provided with emotional security by a human surrogate family, it was still questionable how she would treat an adopted infant. Marianne had been rejected by her chimp mother, who had a history of abusive behavior toward her offspring. Since neither female had experienced normal chimp maternal care as an infant, the adoption held even more promise. The orphaned infants received much-needed attention and physical comfort, and Marianne and Lucy were each provided with an excellent opportunity to practice and develop appropriate maternal care.

Today Lucy and Marianne continue to exhibit and perfect positive emotional support for young Geza and Marti—allowing each to ride and sleep with a surrogate mother. In this way social learning as well as essential knowledge of a new environment are transmitted directly from chimp to chimp without the interim period of dependence on me, a human. This development eases my separation from Lucy. She is being fulfilled and is no longer aloof or overly dependent.

As Dash, the oldest male, nears sexual maturity, he is exhibiting appropriate sexual behavior with Lucy and Marianne. Reproduction seems likely soon.

As I travel with the group, I watch them freely swing through the trees on lianas. I hear them giving food grunts as they approach a favored wild plant, eating until they are full of those foods they once adamantly refused to take. The hardships for all of us seem worthwhile when Marianne recognizes a cobra hidden in the vegetation close ahead of us, and gives an alarm call alerting the others in the group to the presence of danger —a skill that had taken her nine months to acquire. One of her first alarm calls helped protect me. As I entered my cage one morning, Marianne let out an alarm and I saw a cobra not a foot away from me. Since cobras are not easily frightened off, I went outside my cage and patiently waited until it found its way out. Having Marianne take care of me, I was reminded of the not so distant past when her first response to something unusual was to approach and inspect it out of curiosity and ignorance, perilous behavior that could have been fatal. These once-captive animals have learned much of what is needed to survive on their own in the wild. Initially strangers, they have formed strong ties with each other—ties that will help protect them in the future. They will not be alone in facing adversity.

Rehabilitation is not simply freedom from a cage. It takes time and training for the chimps to acquire the skills to live on their own. Lucy, more than the others, has had difficult periods in her adjustment. I have often wondered if she would ever make it. Now as I watch her travel freely with her adopted son walking close beside her, his arm swung over her back, I am convinced it has been worth everything we have gone through.



Dash enjoys playing with food as he balances baobab fruit on stomach.

Although they have now acquired many survival skills for self-sufficiency, they may still confront the same fate as wild chimps. Chimpanzees are now extinct in five African nations and their numbers are declining rapidly in others. Humans are the major threat. The natural habitat of the chimpanzee is being cleared for cultivation and timber. In many areas chimpanzees are eaten. Commercial exploitation of young chimps for entertainment, zoos, exotic pets and research takes an additional toll on an already decimated population.

The existing populations can no longer withstand these pressures. Preservation of existing wild groups in their natural habitat should have the highest priority. The release of once-captive chimps on a larger scale, though difficult and controversial, must be considered. It is imperative that wild chimps be relocated from areas of human encroachment into protected reserves. Man has benefited greatly at the expense of the chimpanzee. Offering chimpanzees the promise of a dignified and free life is a partial repayment for the suffering they continue to experience as victims of our progress.

My role on Baboon Island is not over. For at least another year I will continue to monitor the environment to ensure that there is enough natural food for the chimps to survive the two months of drought each year. I will continue my systematic observation of their feeding behavior, nesting, group integration and learning processes. My research data already show a remarkable convergence of the behavior of these once-captive chimps with that of wild chimps. I hope that my work will demonstrate the feasibility of future projects on an even larger scale, and that my setbacks and successes will serve as guidelines for those projects.

Foraging 80 feet up in the canopy, Lucy often peers down at me. On occasion she picks up a couple of pieces of fruit or leaves, climbs down, and with her other arm wrapped around my neck very gently puts in my mouth a food that has now become a part of her natural diet. As she leads the group to a new area, I feel a sense of pride and relief. I follow now, they lead. I am no longer the central motivating force in their wild existence. I also no longer provide the emotional contact that was so necessary in the early days. This is deliberate on my part to prepare them for my eventual departure. Yet I cannot deny that, as we grow further and further apart, I feel an aching loneliness inside me.

Free at last, young Dash now spends much of his time living high in the trees.

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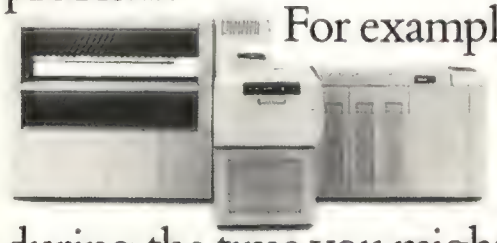

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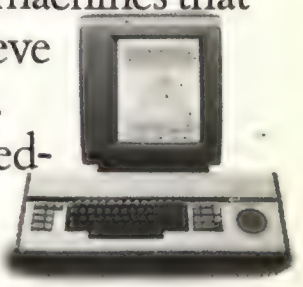

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By Israel Shenker

Familial history of the Tudor Age is brought to life

An indefatigable scholar, after 40 years of effort, has resurrected the day-to-day life of one 16th-century aristocrat and illuminated an era

Pageantry, pomp, lordly circumstances of Henry VIII (full-face, above left) are colorfully represented in

The wooden gate creaks open to reveal a tiny London garden all weeds and neglect, and a narrow, three-story row house built in the 18th century. Inside, the centuries jostle confusedly—threadbare furniture, yellowing newspapers, mutinous ranks of books. "Several generations of things knocking about," says Muriel St. Clare Byrne, historian, author and scholarly editor, who lives here alone and calls herself an ancient of days. She was born in 1895. "I'm sinking into my knees and ribs," she says.

It is in this setting that Muriel St. Clare Byrne has edited *The Lisle Letters,* a stupendous font of early Tudor social history, a massive storehouse of intimate information, and a landmark of 20th-century scholarship. It is an intimately readable work just published by the University of Chicago Press, contained in six volumes, and coming to some two million words. She had been at it for 40 years and her delight in it is delightful in itself.

Climbing the stairs is increasingly difficult, and when she ventures out she wraps up in sensible clothes, a floppy black hat atop her wispy white hair, a walking stick in one hand. At her desk she struggles with a hugger-mugger of correspondence old and new, and with the dying embers of memory. "I'm the daughter of an English father and an American mother," she says. "They met on the top of Pike's Peak in separate picnic parties. They married and came to England. My mother's name was Artemisia Desdemona, the youngest of six children who had sensible names like John and Mary and Charles. She was a schoolteacher in rural Iowa—used to shake the snow off her quilt, harness the horse and drive five miles to school."

Instead of a steed rampant, or at least harnessed, the family coat of arms bears a severed, bleeding hand, recalling a legendary race between two men swimming toward Ireland, the winner to be king. Falling behind, it is said, ancestor Byrne cut off his hand and threw it ashore, so he would be the first to touch land.

She dismisses the account as "nonsense," noting that her paternal grandfather, St. Clare John Byrne, was not a scion of royal blood but the tenth child of impoverished Irish parents. Farmed out to aunts in Scot-

Royal Collection, Hampton Court, by gracious permission of Her Majesty Queen Elizabeth II

The Field of the Cloth of Gold, depicting historic saga in Flanders in 1520. Lisle would have been in retinue.

land, he became England's leading naval architect, designed the warship *Alabama*, most celebrated of the Confederate cruisers, and yachts for the Vanderbilts and for James Gordon Bennett, the newspaper publisher (SMITHSONIAN, November 1978). In the glow of fortune, the family distanced itself from the commonalty of Byrnes, adopting the designer's first name as part of its surname.

"The old man was a bit of a genius, but never passed on a speck of it to his sons," says Miss St. Clare Byrne. "They were awfully good at doing what they wanted to do, but never wanted to do a stroke of work." Her mother and father settled down beside the Royal Liverpool Golf Club. "He spent his days playing golf, his nights playing bridge. Summers we moved to the golf course at Barnton, outside Edinburgh, where he did precisely what he did the rest of the year—played golf during the day and bridge at night."

At Somerville College, Oxford, she was invited to join the literary MAS—Mutual Admiration Society, known subsequently in larger circles as Middle Age Spread. Another member, Dorothy L. Sayers, became famous as author of the Lord Peter Wimsey detective novels. At MAS meetings Dorothy and Muriel grew close, soon exchanged compositions in Elizabethan English, and eventually collaborated on a successful play entitled *Busman's Honeymoon*. In her will, Miss Sayers named her friend literary executor. Miss St.

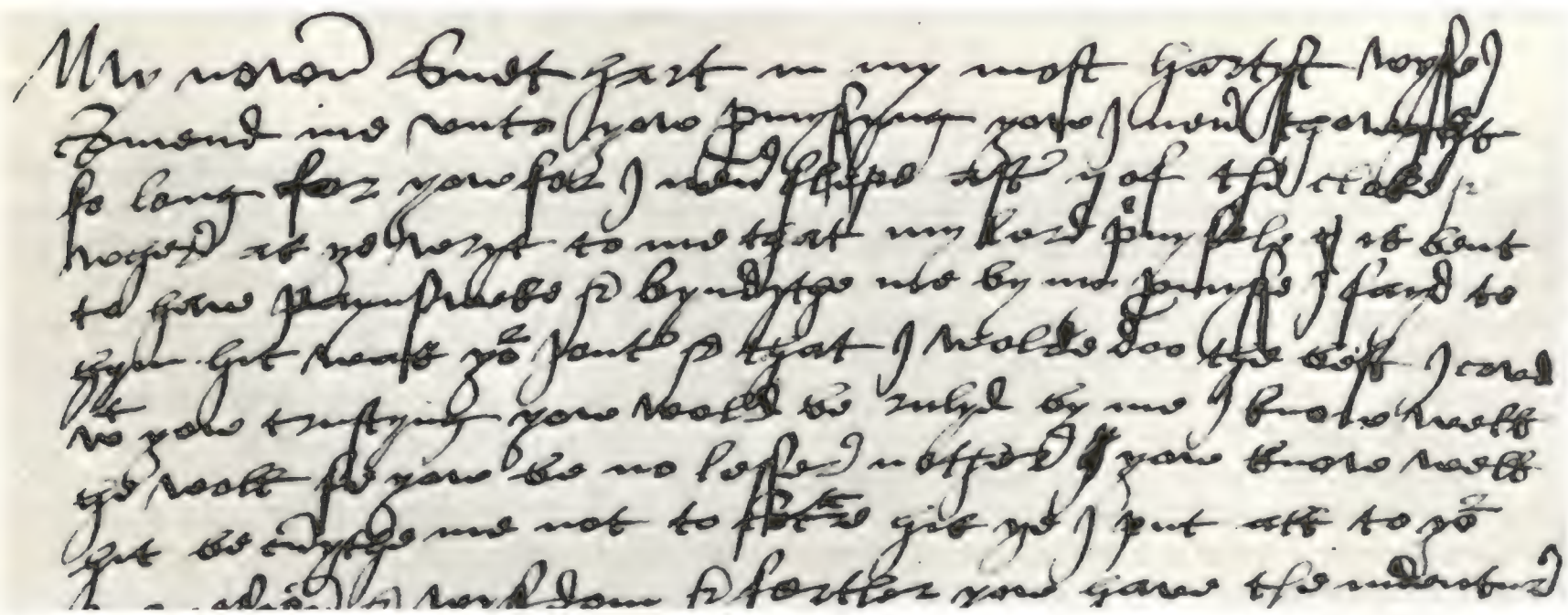
Rubbing from memorial at the Church of St. Mary, Atherington, limns Honor Grenville, Lady Lisle.

Clare Byrne wrote plays of her own and, since she had to make a living and cannot bear golf or bridge, accepted commissions for scholarly editing. At the Royal Academy of Dramatic Art she lectured on literature and theater, especially Elizabethan drama. "Some people fall in love with Charles I," she suggests. "I fall in love with Queen Elizabeth. My first play was called *England's Elizabeth*."

She wrote books on Elizabethan life and compiled a one-volume edition of the letters of Henry VIII. "He did about as well for this country as anyone could have," she says, "and he led to the magnificent reign of Elizabeth. Henry VIII and Elizabeth *put us there*: we had to be reckoned with."

Her appetite for Tudor correspondence was unslaked: "I'd been reading a lot of letters, especially from these dear old ladies of the last century who'd done such delightful collections of women's letters, and I thought one might make more of this." As she examined the correspondence of the Lisles—Viscount Lisle was Henry's Lord Deputy in Calais, governor of England's continental bridgehead—she saw the makings of a much larger work. "I realized this couldn't be one little chatty volume—wasteful to do that," she says. In 1941, T. S. Eliot, the poet who made his prosaic living as a director of Faber and Faber, agreed with her, and committed his firm to publishing her edited version of the letters. As she worked, Miss St. Clare Byrne received grants, fellowships and support from the British Academy and from Queen Elizabeth II.

About 2,000 of the 3,000 Lisle letters are in the 18 archival volumes known as State Papers 3, and most of the rest in the State Papers of Henry VIII. London's Public Records Office had dispatched the national



Language and hand of the time show problem of editing millions of handwritten words. This, from Lord to Lady Lisle, November 11, 1538, begins: "Mine own Sweetheart, in my most heartiest wise. . . ."

Courtesy of The Newberry Library, Chicago

The heraldic procession of the Knights of the Garter is from *The Register of the Most Noble Order of the Garter*, edited by John Anstis, London, 1724. Known as the Black Book, it shows Lord Lisle, number 13.

archives for wartime safety to stately homes and to Welsh caves—to the same places in the caves that they were labeled for in World War I. Discovering that a few people were still working at the Records Office, Miss St. Clare Byrne asked when the evacuated books would be back. An aide suggested: "Well, Miss, suppose you send in a ticket and see what happens." "So Miss sent in a ticket and up came my 18 volumes," she says. "They'd been sitting there the whole time. Much the safest place that they could have been in. I don't think even a Zeppelin falling on top of them would have destroyed the Lisle letters in the basement. Then we started getting alerts every ten minutes for these doodlebugs the Germans were sending over. A condition of being allowed to work was that when the men in charge rang a bell everyone else had to get under the tables. The tables were as good as an air-raid shelter."

She labored to decipher the letters, for they belong to a time when poor handwriting was an upper-class affectation: Miss St. Clare Byrne speaks of "a gentlemanly evil hand." The orthography is exuberant and fanciful, and while introducing modernized, canonized spelling in her edited version, she retained some of the idiosyncratic originals. "I lowly thank your good ladyship for the great kindness," writes John Harris (who signs himself Harres) in the adaptation preceding the original: "y lowle thonke yowre goode ladeschepe ffor the grete kynesse." Calais is Calles, Caleys, Calays, Cales, Callis, Calis and Callys. Lisle is Lile, Lyly, Lylie, Lysle, Leysely, Lessley, Lyssley, Lisley and Lysely. Viscount Lisle favors Lysle, and John Husee (Hussy, Husy, Hsoy, House), his business agent, generally opts for Lyssle. Such license evokes compassion from an editor who suffers crises of identity as Byrnes, Bryne, Brynes, Bryn, Burn and Burns.

As she picked her way through the confusion, she struggled to keep her balance on the thin line separating the two precepts enunciated by Samuel Johnson, who suggested that notes "are often necessary, but they are necessary evils [for] the mind is refrigerated by interruptions," and who acknowledged that "to an editor, nothing is a trifle by which his author is obscured." Miss St. Clare Byrne can hardly bear the notion that details are trifles, and she sought "a pattern of feeling, as delicate as the veining of a leaf, not the causal or dramatic pattern of event and consequence, not the developing excitement of the story, but the undertones and overtones, links and echoes." Her mind is less likely to be refrigerated than irradiated by kindlings of association, and "it would be a poor heart that did not at least make the attempt to share them."

Veteran journalist and author Israel Shenker lives in Scotland. He last wrote about the search for Alexander in the November 1980 SMITHSONIAN.

The Tudor Age brought to life

Collection of Baron Thyssen-Bornemisza

Henry VIII, painted on wood panel by Hans Holbein, imprisoned Lisle in Tower, later exonerated him.

Behind her she felt the burden of years accumulate, ponderous with event and emotion; how to scale the heights and recover a view of things not as they were but as they are, a sense of lives in progress, the warmth of passion and the chill of despair? "You must fall to your knees and rise clutching the earth in your hand, as legend says William the Conqueror did," she writes. "You must seize upon the speech, the character, the way of life, the experience of whatever century is your personal starting-point, catch the quality, temper, and colour of its modes of thought and feeling."

"Penetrate only so far," she suggests, introducing her work, "and the past will close in around you like a great blanketing mist: dulling, muffling, deadening all sounds; throwing back voices at random, or with mischievous misdirection; swaying and eddying giddily till the baffled mind can no longer distinguish between backwards and forwards motion. You are left wandering in the outskirts of a city of the dead, spirits chilled. . . . Rebuild their houses, furnish their rooms, store their larders, lay out their very garments for them; but not so will you persuade the past to send back one individual ghost. Not so can you pass the defences, get beneath the skin, feel the pulse move to the other tune. By their inventories you may rifle a medieval wardrobe and a Tudor plate cupboard, hang their chambers with arras and painted cloths, load their tables, price each item. It is not enough. The senses crave a deeper apprehension; the melody has its overtones, and it is for these that 'the ear for stilled voices' listens, waiting the evocative instant."

Dispelling mysteries, speculating on ambiguities, she establishes her subjects not as bit players but as leading actors drawn to center stage. Increasingly she fell under the spell of the Lisles and of Husee, who survives, vivid and engaging, in 515 letters. "A jewel of a man," says Miss St. Clare Byrne. "The perfect family retainer." But she is too much the historian to ignore the darker side of her chronicle. "Good heavens!" she exclaims. "I don't want just nice people. I want all the bad characters. I want human types. Half of us are perfectly awful."

Arthur Plantagenet, Viscount Lisle—imperfectly good, and central figure of the correspondence—was the illegitimate but acknowledged son of Edward IV and uncle to Henry VIII, who called him "the gentlest heart living." Mr. Lovekyn the tailor established him on the historical stage with a five shilling bill to Edward IV "for my Lord the Bastard . . . for making of a coat of black velvet."

In 1525, Lisle married Honor Grenville, widow of Sir John Bassett and mother of seven, a propertied woman of charm, forceful, assertive and shrewd, always dutiful but not self-effacing, less prepared than her lord and master to accept the sugared word. She pulled wires, managed her estate, schemed for the prosperity of her husband and the fortunes and "preferment" of her children.

The main body of the correspondence begins in

Society of Antiquaries of London

This portrait by an unknown hand is of Edward IV, father of Lord Lisle, grandfather of Henry VIII.

1533, as the Lisles arrive in Calais, and it ends in 1540, with Lisle a prisoner in the Tower of London, charged with treason. On his arrest the letters were seized, became property of the state, and thus survived. What Miss St. Clare Byrne calls "the central paradox" of the Lisle letters, making them an invaluable microcosm of Tudor life, is that because the Lisles were not in England they had to correspond to report political developments, solicit favor, administer property, order provisions, pacify creditors and arrange for the education and advancement of children. England was lands and income, justice and oppression, corruption and grandeur, trials for heresy, preparations for war, word on Henry's late wives and on his latest wife, ribbon for a cap—nothing was too great or too small, and the correspondents included nobles and prelates, merchants and tradesmen, the king's ministers and the sovereign himself. "Haste! Haste! Haste! For thy life," messengers are exhorted, for these are trumpetings of state as well as whisperings of gossip. In 1533, John Salcot, Abbot of Hyde, wrote: "And as for news, we have none worth the writing, but that my Lord of Bangor is lately departed this transitory life and also we have need of rain."

"It's all happening," Miss St. Clare Byrne suggests. "We look at it as something that *has* happened. They are living it. It's life being transcribed, not history being written."

As the correspondence gets under way, the Lisles are taking possession of their establishment in Calais, the inventory of which will list each item of cutlery, every pot and pan, the accoutrements of the bed "with five curtains of blue and tawny sarcenet," provisions in the fish-loft and spicery, and two old cushions discarded in one of the stables. There is a great retinue that includes a worthy rival of the Ancient Mariner and a dogged chronicler who devotes himself to writing a history of the world in Welsh. During the early years of Henry's reign, Calais was a base for overseas adventures, but now the domain is in slow decline. The garrison goes a year without pay; there is no credit for soldiers; prices rise; food is short.

When the Lord Deputy's pleas and warnings are ignored and things go wrong, Henry VIII—cultured, intelligent, egocentric and tyrannical—is not prepared to blame himself. Lisle therefore must endure not only fears of war, depradations of pirates and plaints of subordinates, but—most horrendous of all—his monarch's displeasure. Thomas Cromwell, Henry's Lord Privy Seal and the realm's master intriguer, wrote Lisle: "I have received your letters wherein ye and the Mayor of Calais do desire to have new provisions concerning the restraining of corn otherwise than hath been used in times past. I ensure your lordship the King's Highness is not a little displeased with that your desire, but supposeth your business to be very small that will in any wise importune his Highness with any such matters, Saying that before this time the Town and marches of Calais hath been well maintained, and prospered without any such new devices."

Quail, but fat, for the queen

Viscount Lisle's primordial allegiance was to the king's pleasure, to his largest design and his smallest whim. Comptroller of the royal household to Lord Lisle, May 20, 1537: "My lord, the King commanded me to write to you for some fat quails, for the Queen is very desirous to eat some but here be none to be gotten. Wherefore, my lord, I pray you in anywise that ye will send some with as much speed as may be possibly; but they must be very fat."

Husee quickly supported the appeal, craving "fat quails for the Queen's Highness, which her Grace loveth very well, and longeth not a little for them." He urged immediate dispatch of two or three dozen and "that those same be very fat," with 20 or 30 dozen later.

The Tudor Age brought to life

Alert to the royal crises, Lisle achieved 45 dozen quail and a letter from his local supplier complaining, "I could not obtain them [before], because there are so many Englishmen who catch them. . . ."

On May 24, Husee wrote Lady Lisle: "For immediately as they came unto my hands I rid in post to the court, with two dozen of them, killed; and so they were anon upon 7 of the clock presented unto the King and the Queen's Graces. . . . Those that shall be sent from henceforth must be very fat. . . ."

Offering sage counsel and timely warning, Husee knew how to flatter and when to plead, how to pursue an advantage and when the only recourse is to God or the Holy Ghost. If Lord Lisle must write the king, he advised, the shorter the better, "for I have heard say that his Grace loveth not to read long letters." In the niceties of protocol and the demands of avarice, Husee was the guide indispensable:

"Your New Year's gift the King's Majesty received right joyously. . . ."

"I presented Mr. Cromwell with your baken crane and with the sturgeon, which was thankfully received on his behalf; further saying that for your lordship's affairs he should that afternoon take some pain."

"Garter looketh that your lordship should remember him with some pleasure. A hogshead of Gascon wine were not ill-bestowed on him. . . ."

A member of the Lisle household wrote home to complain that "the search from auditor to auditor, from clerk to clerk . . . and daily attendance, passeth the Bishop of Rome's feigned purgatory; for it lighteth the purse, wearieth the legs, distempereth the body, for when upon promises the suitor thinketh him most sure, he is most furthest from his desire."

In an age when bribes were stock in trade and debts fashionable, Viscount Lisle honored aristocratic tradition by accepting his share of gracious bounty and by accumulating liabilities worthy of his station. Sir Brian Tuke wrote him: "And I trust, my lord, in seven years and more that I have been Treasurer of the King's Chamber I have played an honest man's part with you: and in all that time have not received one penny of your debts to the King, nor one thing that might be to my discharge."

Lisle's response was not cash for His Majesty but gratuity for his Grace's treasurer, and Sir Brian wrote to acknowledge the gift of "a hogshead of claret wine . . . for the which, my lord, I humbly thank your good lordship. . . ."

Plagued by his employer's debts, Husee wrote Honor Lisle "desiring your ladyship that I may have money sent to pay the grocer and chandler, for they never leave crying and calling upon me for it." Again, "I owe the pewterer money for making and changing your vesse," he reports, "and Mr. Lock demandeth money, and the broiderer. Madam, the grocer is unpaid, whereby I have lost a friend."

When he was able to escape from creditors, Husee wasted his substance in antechambers, faithfully reporting each gloss of favor ("his Grace spake few words that day to those that came. And far as I could perceive he spake to no man so much as he did unto me. . . ."), each twinge of doubt ("Your advocates are thick of hearing"). He saw Cromwell unclouded, and relayed the noble lord's words of undying loyalty: "If I should not remember my gentle Lord Lisle I would I were buried." Discerning the noble lord in shadow, Husee dutifully qualified his own reassurance: "As for Mr. Cromwell, he is well pacified and now your lordship's friend, by all outer appearances."

Problems of the lordly life

Domestic cares intruded on grander worries. From boarding school, Honor's young son complained that he must share a bed with two other boys; the schoolmaster righteously rejoined that James' bedmates are scrubbed clean. Daughter Anne is selected as a Maid of Honor at court and must have cloth for smocks and sleeves as there is "fault founden that their smocks are too coarse." Husee prospects assiduously for the fripperies that will please Lady Lisle. "And as for cloth of silver," he writes, "I have searched this town but I can get none that liketh me with the price . . . nothing to pass upon for your ladyship, for it shall never stand with your honor to wear it."

During their rare separations, the Lisles exchanged letters of loving tenderness. "Sweet heart," Viscount Lisle begins. "My very heart root, and entirely beloved Bedfellow," he wrote, styling himself "Your own loving husband for ever," and avowing "For my part I never loved none so well, neither thought so long for

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none since I knew a woman." To such she would reply:

"Surely I shall never be merry till I see you," and went on, "I shall think every hour ten till I be with you again." "I think there is no woman living have thought the time of her husband's absence longer than I have done yours," she suggested, "and so shall continue unto your return and our meeting."

With the king obsessed by heresy and conspiracy, and his ministers preoccupied with power and privilege, the notes of impending tragedy sounded louder and more ominous. "There is divers there that hath been punished for reading and copying with publishing abroad of news; yes, some of them are at this hour in the Tower and like to suffer therefore," Husee wrote anxiously. "It is much better that I stay from writing than to put your lordship to displeasure and myself to undoing."

As talk of heresy grew, Husee asked Lady Lisle not to be offended, "but if it might be your pleasure to leave part of such ceremonies as you do use, as long prayers and offering of candles, and at some time to refrain you and not speak, though your ladyship have cause, when you hear things spoken that liketh you not, it should sound highly to your honor and cause less speech."

Lisle to Cromwell: "My Lord, herebefore your lordship hath written and hath alleged that papish dregs [papeche dryegs] did remain here with us of Calais. My Lord, I dare well say, the King's Highness hath not within his realm no manner of people that favor less the traditions of popes (dradycions of popys) than the King's servants and subjects do here from the highest degree to the lowest."

But charges persisted that Calais was rife with heresy and treason. Sir Gregory Botolf, one of Lisle's three domestic chaplains, whose honeyed tongue earned him the sobriquet Gregory Sweet-Lips, was accused of plotting to deliver Calais to the Pope. Suspicion fell on Lisle, and on May 19, 1540, he was imprisoned. Two years later—a unique case for a man accused of treason—Henry VIII exonerated him; but on the eve of his release Lisle died in the Tower. "When the mercy of the prince was shown it came too late to mend," writes Miss St. Clare Byrne. "To the Viscount Lisle it could restore the Garter and his lands; to the Lady Lisle, her apparel and jewels. To Arthur Plantagenet it could give nothing but an honorable grave; to Honor Grenville, a liberty that had lost all meaning. In this age of second, third, and even fourth marriages, Honor Lisle, who lived on for another twenty-four years, did not remarry."

"The past closes in and engulfs them," she concludes. "The obscurity of four centuries drifts between; the clear-cut lines blur; the tone and racy tang of their individual speech echoes, and is lost. . . . They remain personages, become ancestors; but for those seven years they were humanity itself, clinging to its moment of time."

Neither stone nor inscription marks the burial place of the Lisles. "No one knows the grave of King Arthur," says Miss St. Clare Byrne, echoing a classic lament. Then, from the depths of her long devotion adding a postcript all her own: "And no one knows the grave of *my* Arthur."

But now, in the correspondence that she has edited, is a memorial more resonant than stone, more eloquent than graven word. Here the stilled voices speak again, descanting the vernacular before it sobers into an instrument of scholarship; this is the living tongue, the tumble of wayward sentences, the easy eloquence of daily speech flowing onto paper, the very accents and cadences of Shakespeare, who was not born until 1564 and who wrote what his grandparents' generation spoke.

There are 1,677 letters, caparisoned in modern spellings with punctuation and paragraphs and a vast train of scholarly notes and eloquent comment. Two million words. The work is so long, the printing cost so great, that Faber and Faber first asked the University of Chicago Press to be the American copublisher, then bowed out altogether. So the University of Chicago Press has gone on alone and published *The Lisle Letters* with understandable pride.

Miss St. Clare Byrne sits in the shadow of this work that has taken 40 years to complete, a towering edifice erected in time for her to savor. "It really does knock you sideways," she says.

Looking like the grand old lady of letters she is, Muriel St. Clare Byrne, 86, works in her cluttered study.

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The Great Sphinx is one of the oldest and most famous man-made monuments in the world (two of the Giza pyramids are in back), but, it turns out, its creators may simply have been building upon nature.

Article and photographs by Farouk El-Baz

Desert builders knew a good thing when they saw it

Ancient Egyptian structures and designs may have survived so long because they are close imitations of natural formations

The pyramids of Giza were already ancient, their origins shrouded in mystery, when Herodotus visited them about 450 B.C. Today, these colossal structures are around 4,500 years old, and yet we still ponder: Were they only tombs, or did they also function as geodetic markers, observatories or public works projects? And how is it that they are still standing centuries after other man-made wonders of the ancient world have disappeared? The answer to that may be even older than the pyramids.

Imhotep started it all. He served as minister, adviser, physician and astronomer at the court of Djoser, Pharaoh of Egypt circa 2630 B.C. Imhotep was known as a healer and master sculptor, but, more important, he was the architect of the Step Pyramid at Saqqara (p. 119, bottom).

Until the reign of Djoser, royal dwellings and tombs were built primarily of sun-dried brick. Imhotep selected a site in the desert overlooking Memphis and began planning something more ambitious. He built a *mastaba*, or tomb, of stone, about 26 feet high and

A similar feature at the Farafra Oasis is a natural erosional formation called a yardang. Its shape, and those of streamlined hillocks in background, are aerodynamically stable, last for centuries.

207 feet on each side. Upon it, with several modifications, he built five additions, each smaller than its predecessor. The result is a six-stepped structure, about 204 feet high, that resembles on the whole a pyramid.

Not long ago in Egypt, I pointed at a hill that looked similar to Imhotep's Step Pyramid. My companions from Ain Shams University in Cairo turned to the hill, which became visible only after climbing a 100-foot sand dune. Eyes squinting from the glare of the desert sun, but cameras clicking, we discussed the form of the hill. There was no good reason for its existence amid a sea of dunes. After driving for half a day from the sprawling Siwa Oasis toward the Great Sand Sea, we had not expected any topographic prominences. The terrain has been eroded to a plain by running water and desert winds.

As we continued our geological exploration near Siwa, we encountered other conical hills. These appear to have developed from mesalike elevations, which in turn separated from the large escarpment on the northern boundary of the Siwa depression.

An entry in my field notebook says: "numerous conical and pyramidal hills; I wonder if the ancient Egyptians had studied such natural desert structures before deciding on the form of their towering monuments!"

Why not? The ancient Egyptians had left their mark throughout the Western Desert. In fact, the sound of the word desert itself came to us from the pronunciation of a hieroglyphic word via Latin.

The Egyptians of the past appear to have learned more about the desert than their modern counterparts. They mastered desert exploration and exploitation of building materials. They combed the Eastern Desert and the Sinai for precious metals. No gold veins have been discovered there in modern times. Every known vein had been discovered long ago and worked first by the ancient Egyptians. Even the oldest known map is that of a gold mine in Wadi Hammamat, between the Nile at Qift and the Red Sea at Quseir.

Modern Egyptians are as impressed as anyone else when confronted with the extent of the ancients' knowledge of the desert.

In Egypt, art imitates nature

Natural pyramidal forms, shaped from solid rock, rise in the Egyptian desert west of the Kharga Oasis.

This natural step pyramid, eroded from successively harder layers of sandstone, is near Gilf Kebir Plateau.

"All the way out here to get a stone. It's incredible!" said Mahmoud El-Prince, governor of the New Valley province, who had joined one of our desert investigations in the bone-dry wasteland of the southern Western Desert.

"How in the name of heaven did they find out about that tiny rock exposure in the middle of nothing?" added the team's archaeologist.

"By being damn good geologists, that's how," answered Bahay Issawi of the Geological Survey of Egypt.

This conversation took place at what is called the Chephren Quarries, more than 200 miles southwest of Aswan, in one of the driest, most hostile and featureless tracts of desert anywhere. From an exposure of rock that is only a few feet high, the ancient Egyptians mined a rock and carved it in the likeness of Chephren, the builder of the second largest pyramid at Giza. This mysteriously dark statue was found virtually intact in the Valley Temple of Chephren's pyramid complex at Giza.

The ancient Egyptians not only knew where things were in the desert but, I believe, realized that the shapes they found were no accident. They must have wondered why—why, for example, is it that only tapered hills persist in the desert? Imhotep may have asked himself that question, as I did a few years ago. The great sage could have figured it out in no time at all. I had to work at it.

On one of a dozen journeys into the Egyptian desert, 60 miles west of Kharga Oasis, I saw three hills (right, top) looming in the distance in a mirror image of the pyramids of Giza. The sight heightened my curiosity. This was the windy season, when the wind carried enormous quantities of debris, redistributing it as it eroded obstacles in its way.

With a strong gust of wind, much fine dust was lifted from among the pebbles and sand grains on the desert surface. The wind hurled the dust toward one of the conical hills. With the first collision, the dusty wind rose swiftly upward as it whirled about the hill.

Eureka! The conical shape evades destruction by leading the wind upslope and funneling its erosive power to the peak where its energy dissipates in the air. Inhabitants of windy terrain must have learned this a long time ago. Images of conical or cone-topped structures that I have seen all over the world flashed in

Dr. El-Baz directs Center for Earth and Planetary Studies at the National Air and Space Museum. He is also a science adviser to Egypt's President Sadat.

The pyramids of Giza may have survived the millennia because their builders followed even older examples.

The first man-made pyramid, more than 4,500 years old, accentuated the steplike pattern seen at left.

front of me: American Indian tepees; Bedouin tents in the Sahara; dwellings and storage bins in the Rajasthan desert of northwest India; Mongolian and Kazak yurts in central Asia.

Unlike conical hills, the pyramids have sides. Why don't they erode to the least resistant, smooth form? Roundness may not be necessary. We encountered natural faceted hills deep in the Western Desert, and there are others at Lake Nasser. The pyramids of Giza exist in near perfect harmony with their environment. They predate the other Seven Wonders of the World by approximately 2,000 years, and yet they are the only one still standing. Had the ancients built their monuments in the shape of a cube, a pentagon or even a stadium, they would have been erased by the ravages of wind erosion long ago.

It makes sense, of course, to believe that the man-made structures were fashioned after natural forms, just as it makes sense that at least some of the pyramids were built over existing hills rather than up from flat ground. In his book *The Pyramids*, Ahmed Fakhry states that a rocky knoll of unknown size underlies the Great Pyramid, and that a large natural stone outcropping cores the tomb of Queen Khent-kawes.

Origin of the Sphinx

Could the Sphinx reveal further knowledge? Its origins may even be more intriguing than we believe. Some scholars contend that the bulk from which the Sphinx was formed had been left by the quarrying for the Great Pyramid. But I favor another explanation. Let us imagine a "staff meeting" of the master architect of Chephren's pyramid. The sun has already started to warm up the brisk morning air. Apprentice architects, quarry engineers and a transportation expert unroll papyrus, on which site drawings are meticulously drawn, and place it on the table for the ensuing discussion. Chephren's pyramid was to be built next to its predecessor, the Great Pyramid, on the western bank of the Nile. Blocks of hewn stone would arrive by barge and then move over special roads or ramps to the building site.

The meeting progresses under the shaded, breezy shelter on the Nile bank near the pyramid hill. The transportation expert appears preoccupied, for he repeatedly draws with his finger a rectangle with equidistant lines ribbing it from top to bottom. He is drawing in his mind the hieroglyph *inr* denoting stone or rock.

"How about the elongate *inr* on the east side?" he finally asks the master architect.

"What of it?"

"It's in the way. We really should think about removing it."

"Well," replies the aging master, "I have long enjoyed its streamlined contours. Such a carving of beauty should not be considered a *sedjeb*, an obstacle that must be removed!"

"Yes, I agree," says a young architect. "We can even enlarge it, dress it up and make a monument out of it —a monument to Pharaoh, of course."

"Good, I like this idea. Let us learn from nature as the great Imhotep did. I am sure our friend the mover can find roads about the *inr*. I will speak to Pharaoh about this."

What was the streamlined shape that the master architect spoke of? For clues to the original form of

Natural limestone formations like these may have been the inspiration for circular tents around the world.

Mongolian yurts, American Indian tepees and Bedouin tents in the Sahara have worked for centuries.

that elongate rock, we go back to the close of the 19th century, and journey into the desolate wastelands of central Asia. The tour guide is a rugged Swedish explorer named Sven Hedin. For nearly 25 years, starting in about 1890, he roamed the virtually unknown lands of the Asian interior.

In the rocky desert near Lop Nur at the east end of the Taklimakan Desert, he ran into a landform that was unknown to him: endless numbers of ridges arranged in parallel rows with gullies in between. His guides called the ridges yardangs, from the Turkic word *yar* meaning steep bank.

"With amazing regularity and without the slightest interruption," Hedin wrote in 1905, "this dry clay soil is furrowed throughout by pretty deep gullies, which separate the jardangs one from another. The only variety they present arises out of the consistency of the surface, that is to say, out of the varying resistance which it has offered to the corrosive, abrading force of the wind. . . . Each ridge was broken off pretty abruptly on the north-east, but had a gentle slope towards the south-west."

Yardangs became a topic of investigation by three of my colleagues and fellow desert travelers—Carol S. Breed, Maurice J. Grolier and John F. McCauley of the U.S. Geological Survey in Flagstaff, Arizona. Their measurements and observations of yardangs in deserts around the world indicate that the critical morphological characteristic of a yardang, streamlined by the wind, is that its length greatly exceeds its width, by a ratio of about three to one or more.

Many such yardangs exist in the Western Desert of Egypt. In fact, one of the largest fields may be that north and east of the Kharga Oasis, where the wind-carved hills extend for hundreds of miles. The hills look like inverted boat hulls with prows pointing into the wind. "Mind you," said McCauley, "these yardangs are not carved of soft silts or sandstone, but incised in hard, crystalline limestone."

What do yardangs have to do with the Great Sphinx of Giza? Breed, Grolier and McCauley agree that the Sphinx was fashioned from a hillock of limestone that had already been streamlined by the wind.

You may think that the distinctive shape of the Sphinx must be quite different from a wind-eroded knoll of rock. Not true. As early as 1909 the British geologist H.J.L. Beadnell described in the Kharga depression "thousands of isolated hummocks, disposed with their longer axes parallel and in the direction of the prevailing north winds." These same structures were described in 1924 as sphinxlike by the German geomorphologist Johannes Walther. Furthermore, in 1939 the British explorer Ralph Bagnold characterized similar forms between Kharga and the Gilf Kebir in southwestern Egypt as "mud-lions."

Thus, the reclining lion body of the Sphinx could have originally been shaped by the wind.

I proved the point to my own satisfaction when I was able to convince a skeptical graduate student. On a visit to the Farafra Oasis, I called him over to see the best example I had yet found. He stood there for a few minutes transfixed by the sight. Mesbah Khalil had heard us speak of yardangs and sphinxes, but he thought the analogy was farfetched. Even when I

These tents, used by the Geological Survey of Egypt, follow traditional North African design, which in turn seems to follow nature's. Their success over the centuries cannot just be a matter of chance.

showed him yardangs in Faiyum and Kharga oases, he shrugged his shoulders, "I don't see the Sphinx in these; they have all been beheaded!"

The one he stood by in Farafra Oasis was not. It was complete with a neatly carved head in the shape of a dog's (p. 117).

"My God!" he exclaimed. "The first thing I am going to do when we get back to Cairo is to revisit the Sphinx and pay respects to my ancestor engineers."

He walked toward the silent statue of limestone rock that dramatized the wind as a sculptor. For after the wind had created the inverted boat hull, it acted upon its prow, pruning it as it swirled in vortices.

The architects of Chephren could have studied such forms thousands of years ago, and decided to dress up in his image the yardang on the east side of their Pharaoh's pyramid. It looks this way to me.

We owe much of our understanding of ancient Egypt to Jean François Champollion, the philologist who in 1821 completed the decipherment of the Rosetta stone and thus founded the science of Egyptology. Jacques Champollion, an archaeologist and a descendant of Jean François, wrote: "The total length of the monolithic sphinx is one hundred seventeen feet; the contour of the head at the forehead is eighty-one feet; the height from the stomach to the top of the head is fifty-one feet." He also says: "its height of forty feet above the ground is the witness and measure of the quantity of stone removed from the surface to leave this elevation on the plain."

Such a monumental task would not have been necessary if they had started with a yardang.

The evidence indicates that when they embarked on perfecting the form to make it more convincingly lifelike, they dug more rock from its sides. The farther west they went, the deeper they had to dig in the pyramid hill. The resulting moat was later filled by blown sand after years of neglect when civilization in Egypt declined. Most of the "addition" to the natural form remained buried until unearthed in 1926.

One writer has even suggested that in addition to decorating the head and shaping the paws, the ancients engineered the Sphinx to make it usable as a geodetic marker and that the Sphinx once had an obelisk between its paws whose shadow could be used to compute the Earth's circumference.

Today, the Sphinx is showing signs of old age; part of its surface is slowly wasting away. One reason may be the unusual rise of the water table.

"We can trace this to the Aswan High Dam," says Bahay Issawi. "The enormous Lake Nasser and the year-round irrigation of crop fields has caused a dangerous rise of water levels throughout the country."

As water seeps through the porous limestone rock of the Sphinx, it brings with it salts in solution that expand as they crystallize at the surface, flaking off bits of the ancient Sphinx.

This is perhaps ironic. If the Sphinx is a symbol of the ancients' understanding of the environment, a monument in harmony with nature, then it is now being adversely affected by a modern symbol of our control of nature. In our rush to "develop" the Earth, we may neglect to learn valuable lessons from what the ancients left for us, sometimes carved in eternal rock.

Looking for all the world like some heroic sculpture, this limestone form was carved by winds in Egypt's Western Desert near Farafra Oasis.

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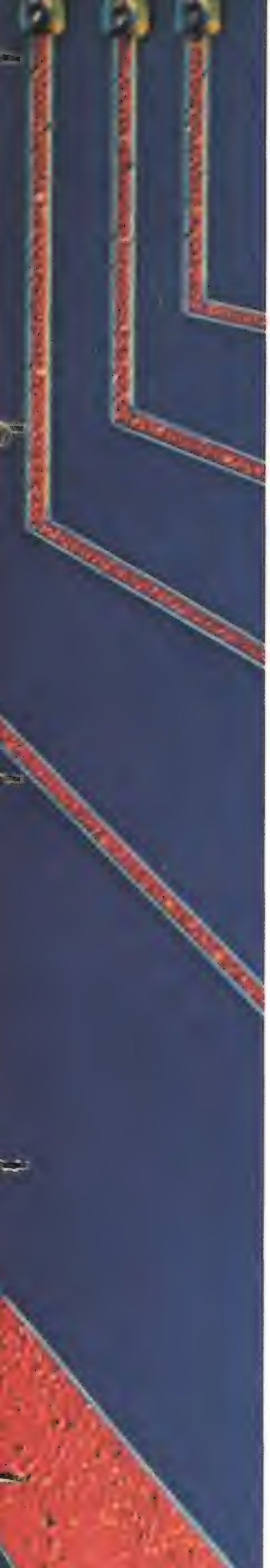

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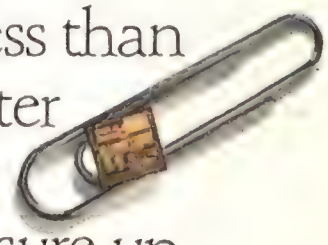

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Cipher Number One supposedly tells exact location but so far no "solutions" have led to treasure.

By Ruth Daniloff

A cipher's the key to the treasure in them thar hills

Cryptanalysts and fortune hunters lead a merry chase through the Virginia countryside in search of Thomas Beale's buried loot

Colonel J. J. Holland plunged his post holer into a mound where his metal detector registered ten and brought up a scoop of dusty earth containing several lumps of coal. At 70, he had been warned by his doctor against digging because of a serious heart ailment, but his obsession with the treasure he believes lies six feet under the dirt beside the railroad tracks somewhere in Virginia overrides all common sense. Since 1964, when he first learned of Thomas Jefferson Beale, the 2,921 pounds of gold, the 5,100 pounds of silver and some $200,000 worth of jewels, he has clocked up more than 150,000 miles driving to the foothills of the Blue Ridge Mountains near Roanoke, Virginia, to dig. At home in Lillian, Alabama, he works most nights from 10 to 2 on the ciphers relating to the treasure. This time he is convinced he has broken the first of the three codes. "What we need now is a backhoe," he says with obvious frustration. "Then we can dig down and find the grave and solve this Beale thing once and for all."

For more than 130 years people like Colonel Holland have been trying to find the Beale millions

Cryptographer Carl Hammer, right, joins treasure hunters as they go over map.

The Peaks of Otter in the Blue Ridge Mountains may be a clue to where Beale buried gold, silver and jewels 160 years ago; treasures unearthed so far include an old car and a chunk of pig iron.

"once and for all." It is one of the largest and most costly treasure hunts in U.S. history, baffling the finest mathematical minds in the country and defeating their computers. Like the search for the Lost Dutchman mine in Arizona, or the stories of the $3 million in Confederate treasury gold buried along the James River just before the Union soldiers entered Richmond in 1865, or wealthy plantation owners' fortunes hidden from the Union soldiers and never recovered, the Beale treasure tantalizes its seekers with fantasies of untold riches while inducing frustration, despair and bankruptcy. Numerous articles in magazines and trade journals and several books have explored the Beale mystery.

Thomas Jefferson Beale, the man responsible for trying 20th-century brains and technology, was a devious Virginia gentleman believed to have been born around 1792. That was the year George Washington was elected President for the second time; Thomas Jefferson and Alexander Hamilton were feuding over policies which would culminate in a two-party political system; and General Anthony Wayne was commissioned commander of the American army to fight Indians who were making pioneer existence in the Northwest Territory impossible.

Beale came from a distinguished family. In 1668 King Charles II of England recommended one of his ancestors for appointment as commander of Point Comfort, at the entrance of Norfolk Harbor. Though one contemporary described Beale as "a gentleman well educated, evidently of good family, and with popular manners," recent research reveals him to have been a no-good, gun-slinging genius who was constantly bailed out of scrapes by his more respectable brothers. Still, women loved him—he was a broad-shouldered six-footer with swarthy complexion and jet black hair worn slightly longer than was fashionable. He was said to be a "model of manly beauty, favored by ladies and envied by men."

Indeed, the Beale treasure hunt may have started with trouble over the opposite sex. There are several stories—some documented, some not. One story holds that in the spring of 1817 Beale got into a pistol fight with a Fincastle, Virginia, neighbor over a woman.

Photographs by Anne B. K. Krumbhaar

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Believing he had killed the man, Beale lit out for the frontier to escape prosecution. Beale's version of the story was that he and 30 individuals of good character were seeking adventure and left on a two-year expedition for buffalo and grizzlies.

Whichever is true, a year later when Beale and his hunting cronies were preparing supper in a small ravine some 250 miles north of Santa Fe, they discovered strange stuff in the rocks. "Upon showing it to others," Beale wrote, "it was pronounced to be gold, and much excitement was the natural consequence."

In two letters, Thomas Beale described the gold, its journey back to Virginia in two wagons and its subsequent burial. He deposited the letters in an iron strongbox, and in March 1822, he left the box with his friend, Robert Morriss, for safekeeping and disappeared. Morriss, who had fallen on hard times as the result of "heavy purchases of tobacco, at ruinous figures," was the innkeeper at the Washington Hotel in Lynchburg, Virginia.

Two months later Morriss received a mysterious letter from Beale posted on May 9 from St. Louis, then a small hunting and trading post on the western frontier. Beale's letter stated the box

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Cipher addict Carl Nelson works at home, believes human eye beats computer.

contained papers which would be "unintelligible without the aid of a key. . . . Such a key I have left in the hands of a friend in this place, sealed, addressed to yourself and endorsed not to be delivered until June 1832." That was the last Morriss heard from Beale.

In 1845, 23 years after receiving it, Morriss opened the box. "I had the lock broken," he later testified, "and, with the exception of two letters addressed to myself, and some old receipts, found only some unintelligible papers covered with figures. . . ." The unintelligible figures turned out to be three ciphers. According to Beale's letters to Morriss, the first cipher (p. 126) described the exact location of the treasure. Cipher Number Two described the contents of the vault and Number Three listed the names and addresses of the people involved.

Seventeen years later, a year before he died, Morriss handed the box and its contents over to James Ward, a trusted family friend. A gentleman of independent means, Ward worked day and night on the codes until he finally succeeded in breaking Cipher Number Two by using a key based on the Declaration of Independence. The message reads as follows:

"I have deposited in the County of Bedford about four miles from Buford's in an excavation or vault six feet below the surface of the ground the following articles belonging jointly to the parties whose names are given in number three herewith. The first deposit consisted of ten hundred and fourteen pounds of gold and thirty eight hundred and twelve pounds of silver deposited Nov. eighteen nineteen. The second was made Dec. eighteen twenty one and consisted of nineteen hundred and seven pounds of gold and twelve hundred and eighty eight of silver, also jewels obtained in St. Louis in exchange to save transportation and valued at thirteen thousand dollars. The above is securely packed in iron pots with iron covers. The vault is roughly lined with stone and the vessels rest on solid stone and are covered with others. Paper number one describes the exact locality of the vault so that no difficulty will be had in finding it."

Ward struggled with Ciphers One and Three till his determination and his family fortune ran out. In 1885 he gave up and published "The Beale Papers" which included copies of Beale's letters to Morriss and Morriss' testimony, as well as an account of his own efforts to break the ciphers. To future treasure hunters, however, he issued a warning: ". . . devote only such time as can be spared from your legitimate business to the task, and if you can spare no time, let the matter alone."

Sound advice, but not the kind taken by cipher addicts or those like William Legrand, the hero of Edgar Allan Poe's short story, who are smitten by the Gold Bug. Deeply ingrained in the American psyche are a couple of optimistic beliefs: every problem has a solution and millionaires happen overnight.

Using computers, Carl Hammer has spent 20 years trying to break Beale ciphers.

Free-lance writer Ruth Daniloff's search for the treasure yielded this story.

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Sixteen years ago a prestigious group of intellects joined forces to outwit Thomas Jefferson Beale. The Beale Cypher Association (BCA) includes big-name computer experts like Dr. Carl Hammer, director of computer sciences at Sperry Univac; Per A. Holst, senior research manager at the Foxboro Company, an industrial process control company in Massachusetts; and top cryptanalysts from the CIA and the National Security Agency, such as Carl Nelson jr., now retired, who was the technological wizard behind the super-secret Berlin tunnel dug to intercept Communist communications.

The 100 members share information, but with more than 20 million dollars (at today's prices) at stake, some are reluctant to exchange vital data. After a recent newspaper article, some 10,000 letters flooded the office of BCA Executive Director Per Holst, most of them requesting information rather than volunteering it. Suspicion, Holst fears, undermines the massive effort to solve Thomas Beale's puzzler. Still, he argues, it is only a matter of time before the ciphers will be broken and the treasure, if it exists, found.

Breaking the Beale ciphers, however, is proving easier said than done.

Underlying cryptanalysis are two linguistic peculiarities. First, in all languages, some letters are used more often than others. In English, for example, the most frequently used letter is E followed by T. Second, the proportion in which the letters occur remains constant. Take 1,000 letters from a cookbook, a military manual or a love letter and the frequency of certain letters is the same. With an enciphered message, the cryptanalyst utilizes known frequency combinations to

Smithsonian Institution

Thomas Jefferson invented cipher wheel in 1790s when encoding was popular.

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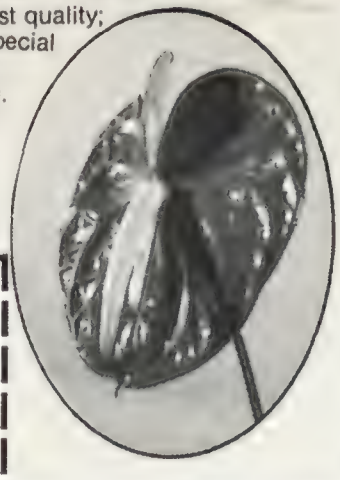

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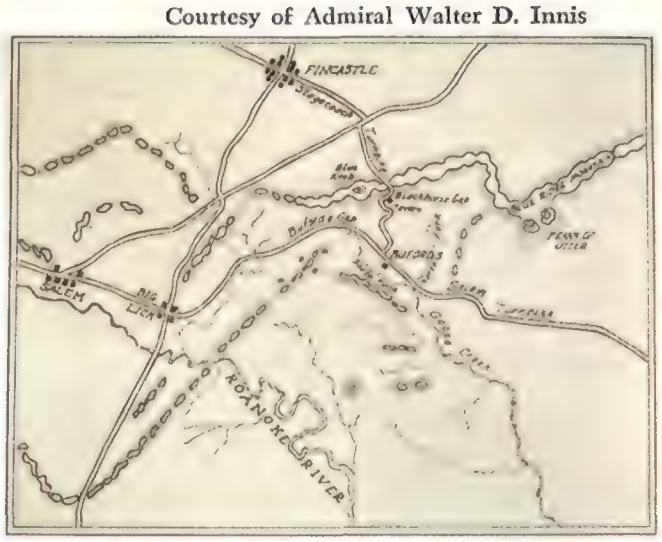

Treasure map shows Virginia area disclosed years ago in second cipher.

tease out the original message. If, for example, there is a high proportion of the letter H, he makes the assumption that it is an E substitute.

The Beale ciphers are what cryptanalysts call multiple substitution ciphers. Since every letter in the coded message is represented by several different numbers, it is one of the most difficult ciphers to break. In the case of Cipher Number Two, cracked by James Ward, Thomas Beale first composed his message, then took the Declaration of Independence and numbered off the words, starting with 1 (when) and ending with 1,322 (honor). He substituted each letter of his original text with a number of a word in the Declaration beginning with that letter. Since there are only 26 letters in the alphabet, there were plenty of extra equivalents, which Beale chose to use at random. For example, in the opening lines of Cipher Number Two, the letter E is enciphered by the numbers 49, 7, 79 and 37.

For an educated gentleman like Beale to be an expert cryptographer was not unusual. In those days waylaying other people's mail was common practice. To ensure privacy, people created their personal ciphers based on common books of the day. Thirty years before Beale supposedly devised his devilish codes, Thomas Jefferson had invented a cipher wheel (p. 132) that was so brilliantly conceived that a similar one was used by the American military early in World War II. By dividing a cylinder into wheels, each marked with the 26 letters of the alphabet, he could scramble messages in thousands of different ways. According to Professor Ralph E. Weber, author of the recently published book *U.S. Diplomatic*

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Codes and Ciphers, today's historians are frustrated by the coded segments of old documents, letters and diaries which, like the Beale ciphers, cannot be cracked because the keys are lost. "Some of these messages could have real historical significance," says Weber.

Finding the key, of course, is the answer. "With a key," says Carl Hammer (p. 130), who professes to be more interested in unbroken ciphers than Beale's treasure, "a second grader could decode the Beale ciphers." According to historians, Beale could have been familiar with some 2,000 books and government documents which he might have selected as the key. Many have been analyzed, including Shakespeare's plays, the Bible, several versions of the Magna Carta, as well as U.S. historical documents such as the 1606 charter of Virginia, the Mayflower Compact of 1620 and even the 1733 Molasses Act. A researcher currently is looking through early-19th-century stock inventories of book stores operating in Lynchburg at the time.

Two schools of thought exist as to whether Thomas Beale will meet his match by computer or by hand. "We have played games with these numbers which would have taken a million men a billion years to duplicate with pen and paper," declares Carl Hammer, who is betting on the computer and a team of University of Maryland experts currently working to solve multiple substitution ciphers.

While a computer has failed to locate the treasure, Dr. Hammer and the Univac 1108 have proved the codes genuine, not just a bunch of random numbers Beale pulled out of a hat after a night on the town. "They contain intelligent messages of some sort. The method used for encoding Ciphers One and Three is similar to that used for Number Two," says Hammer, who has spent thousands of hours over the last 20 years feeding combinations of letters and numbers into generations of Univac computers.

Buford family graveyard is possible site; so are 400 other cemeteries in area.

Carl Nelson (p. 130) is backing Man over machine, relying on traditional cryptanalysis, reinforced by meticulous field research which he believes vital to any code breaking. Computers waste time on what he calls "garbage in and garbage out." Reprogramming is just as hard as working on the ciphers by hand, he finds, as he grinds away in the basement office of his Arlington, Virginia, home, covering hundreds of yellow legal pads with thousands of number and letter grids. In the end, he adds, "the human eye is still better than a computer at recognizing certain patterns and frequencies."

Nelson's passion is unbroken ciphers. "I just can't leave them alone," he confesses. He combats cipher addiction by limiting his work on the mystery to the winter and taking time out for another hobby—cracking the musical tonal scale system used in Jerusalem in the year 2 B.C. with the idea of using it to compose a musical score for the Dead Sea Scrolls.

One of the pitfalls of a multikey, multialphabet cipher similar to Beale's is that it is sometimes possible to obtain an intelligent message depending on the documents used as keys. As with some crypto-

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Map in lap, Pauline Innis explains theories; she has written book on Beale.

grams, there can be different solutions, but only one correct one.

To test a solution, it is necessary to hot-foot it down to the Blue Ridge, to match clues to the local geography with the help of compasses and historical survey maps. Needless to say, most decipherings bear little relationship to the geography. A recent "solution" from a treasure hunter in Maine gave instructions to start at the old Buford's Tavern in Montvale, Virginia, climb the nearby Peaks of Otter and finally surface in Jefferson's bedroom at Monticello—a feat which would have involved excavating a 60-mile tunnel along the mountains. A few solutions, such as Colonel Holland's recent one terminating beside the railroad tracks (p. 128), are strikingly true to local landmarks.

When the text and the landmarks match and your metal detector signals "treasure," it is time to bring out shovels, hire backhoes or bulldozers, and buy dynamite before someone else beats you to it. A recent solution gave instructions to penetrate a deep-water pit in a disused mine on Purgatory Stream, 45 miles northeast of Roanoke. All the digging party found was a 90-pound chunk of Colonial era pig iron—a treasure in its own right. Another fortune hunter wasn't so lucky. His metal detector went berserk over a rocky area in Bedford County where his solution located the treasure. He hired guards, fenced off the area and brought in a bulldozer, only to unearth the remains of a 1930s car.

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Such solutions are mostly forced, and based more on wishful thinking than good cryptanalysis, maintains Per Holst. "Many people see interesting and revealing messages just in a sequence of syllables, in a series of short, spaced-apart words and in the occasional medium-length word that might pop out of their deciphering effort," he says. Historical context is ignored. For example, Beale's method of enciphering may have been diabolical, but the instructions for deciphering would have to be simple for an innkeeper like Morriss to follow.

"I don't think we have skimmed the surface yet," Holst says. "Instead of just taking a first letter, he could have taken every second vowel, or even every second letter after a vowel, which is mathematically very difficult without a key, but from an instructional point of view simple."

"Let's face it, we are a bunch of crackpots," jokes Carl Hammer, "but we have a lot of fun."

Farmers and landowners in Bedford and Botetourt Counties, Virginia, are not so amused by the "crackpots" who tramp their property with magnetometers, Geiger counters and metal detectors. Cattle fall in the holes left by bulldozers. Dynamite explosions frighten people. And worst of all, under Virginia law the treasure belongs to the finder—even if he or she trespassed to find it—unless the

Frances Beal, a distant relative, is avid member of Beale Cypher Association.

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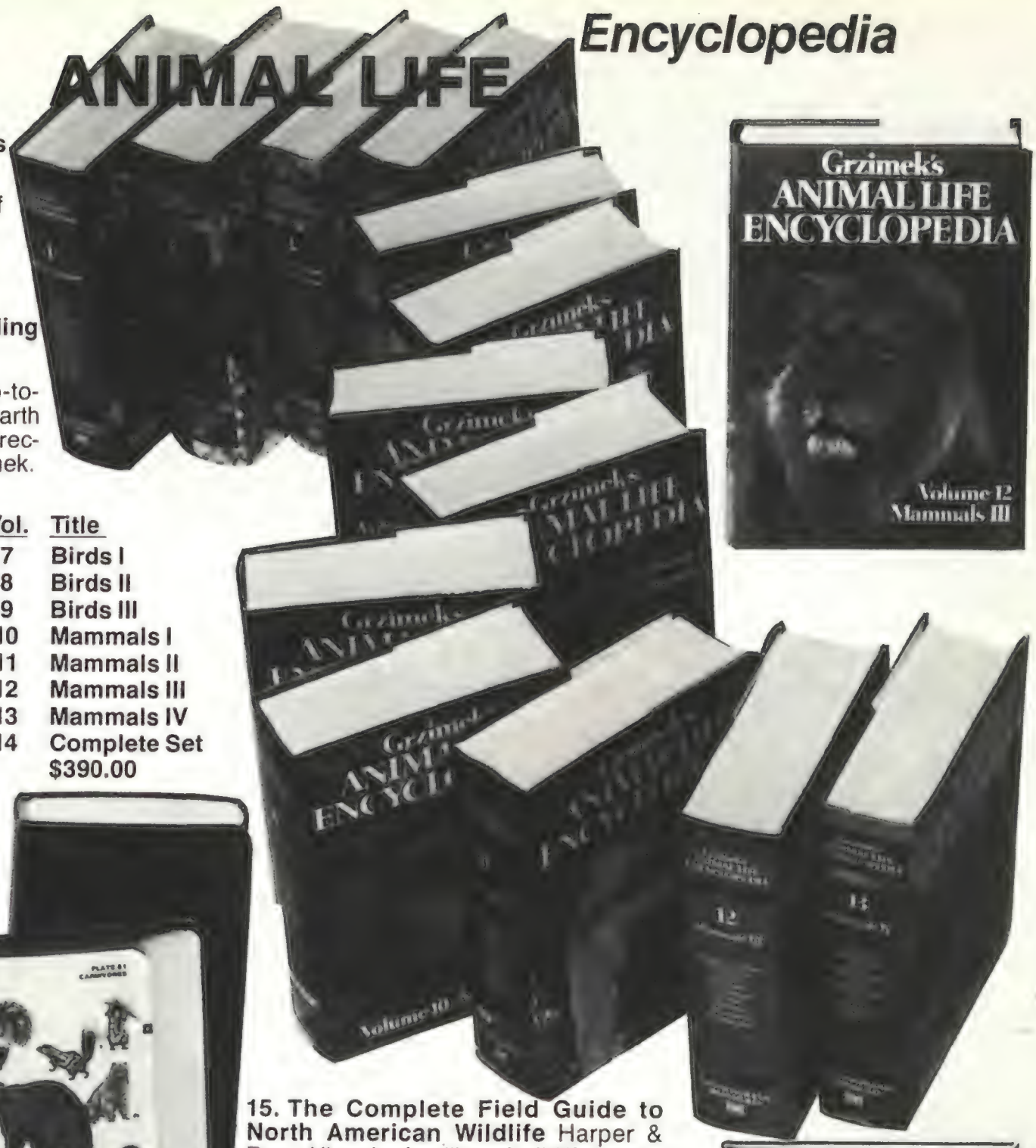

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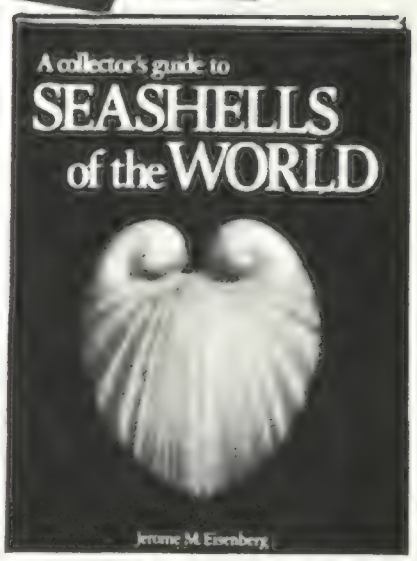

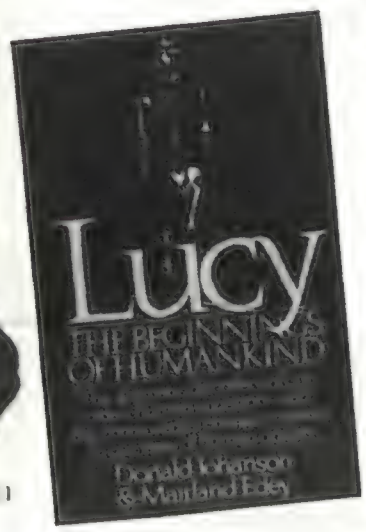

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Mike Timmerman uses metal detector, an invaluable tool of modern-day hunter.

direct descendants of the original owners are identified within a year. Since Thomas Beale left no children, his fortune is up for grabs. Now that metal detectors and the inflationary price of gold have made treasure hunting one of America's fastest growing pastimes, Bedford County locals fear an invasion. That's why they sometimes take potshots at strangers.

Some farmers, like Lee and Otis Dooley, on whose land many believe the treasure lies, draw up legal contracts with the hundreds of treasure hunters who want to explore their property. A 25-percent cut of the treasure, they insist, is theirs. Last summer with gracious Southern courtesy the two brothers agreed to show landmarks to a hunting party from the Beale Cypher Association. They pointed out the large oak tree with the blaze down the gnarled trunk, the rock ledge overhanging Goose Creek, the 20-foot cave in the woods and the large hole near the farmhouse excavated by a New York couple who spent seven summers camped in the meadow in order to dig.

Asked what he would do with his share of the treasure, Lee squinted toward the blue-hazed mountains in the distance and shrugged philosophically. "I don't rightly know," he replied. "I was born in pov-

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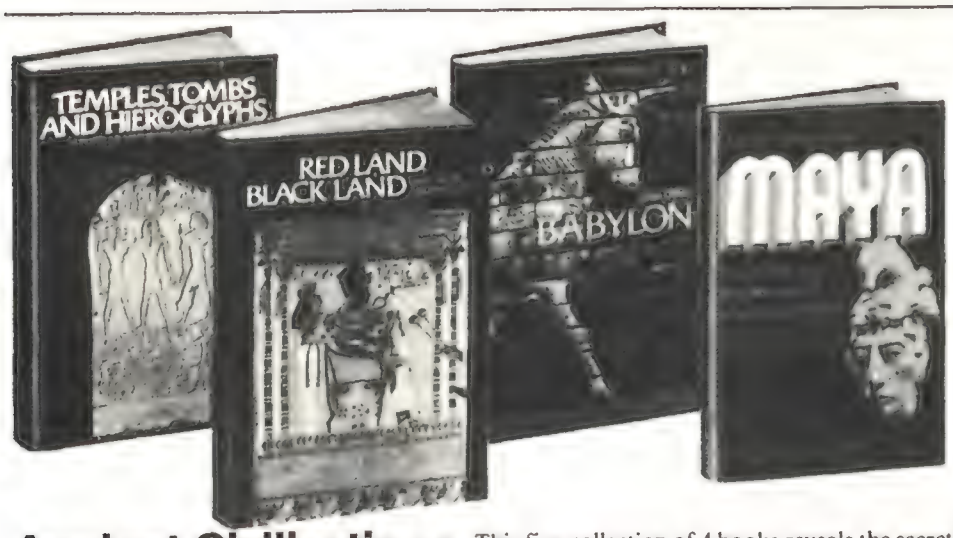

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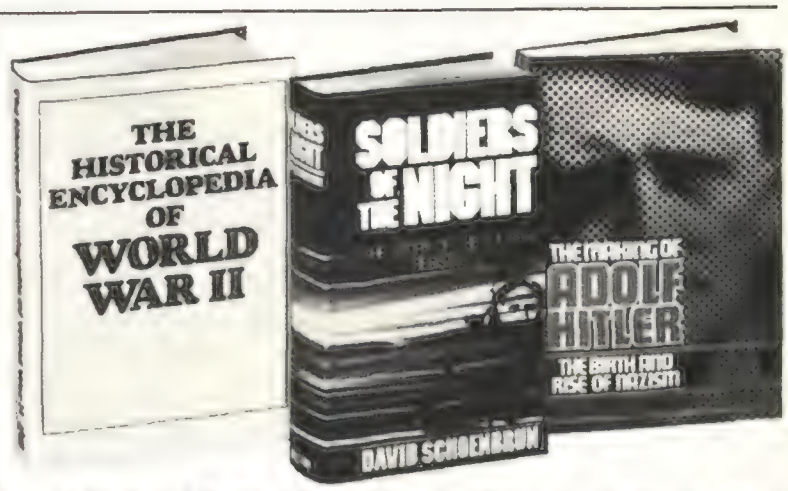
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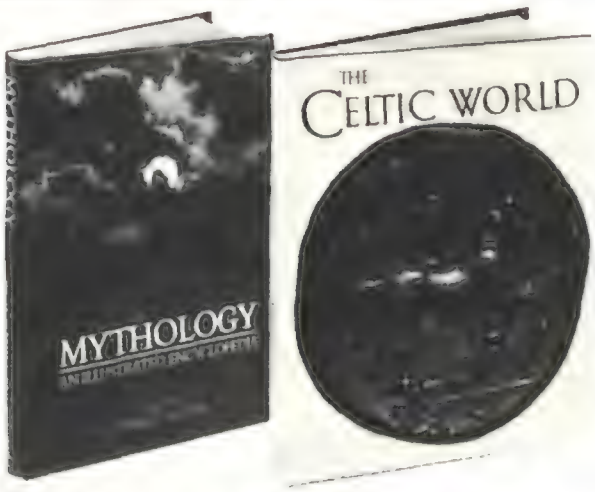

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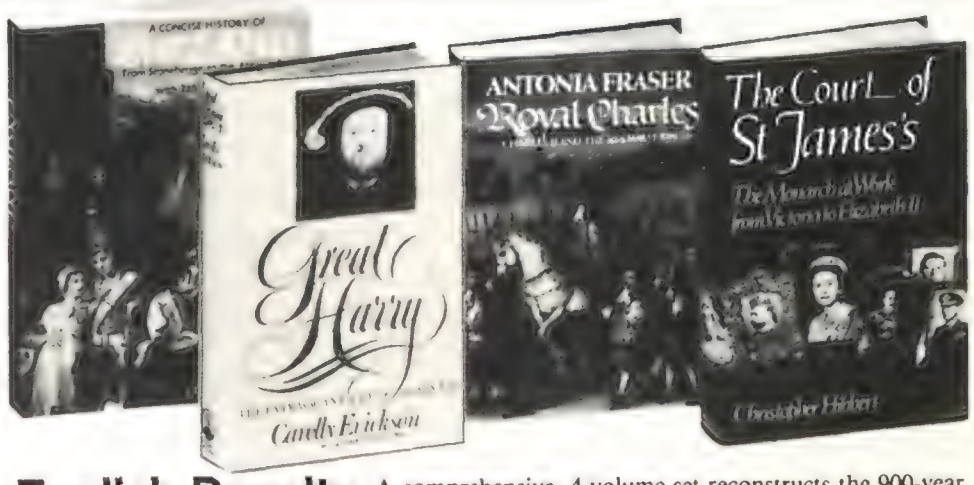

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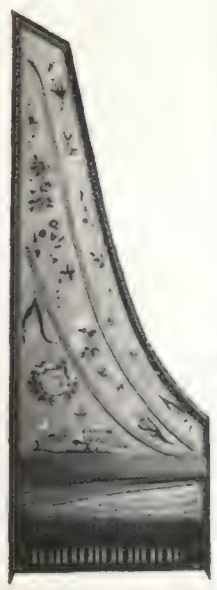

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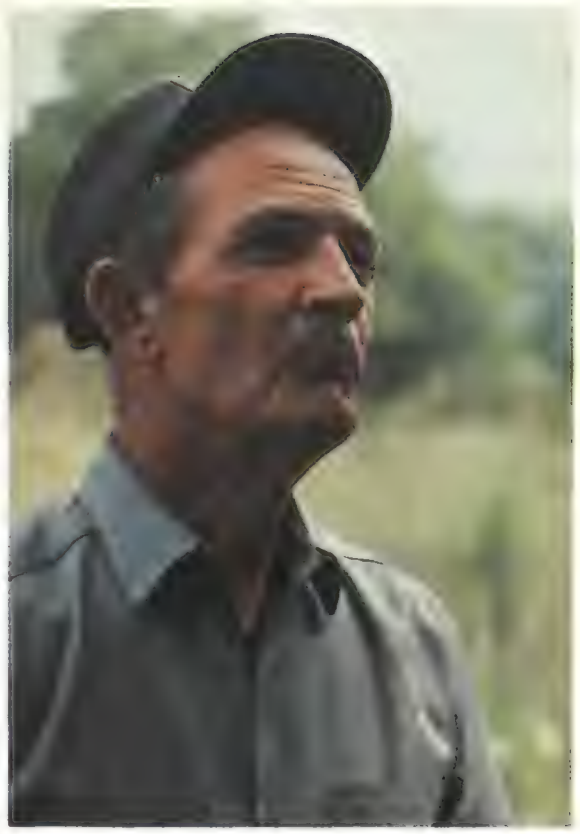


Farmer Lee Dooley says of treasure: "That money would just mess me up."

erty. Getting all that money would just mess me up."

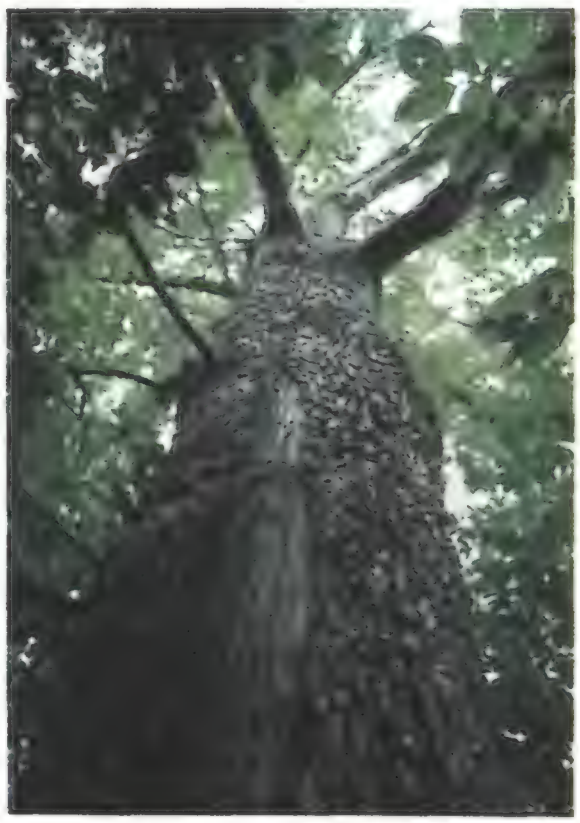
The big question is, of course, does the treasure really exist? The ciphers may be genuine, but the treasure may have disappeared. It could be a hoax, or a cover-up for a Civil War bank robbery or a hijacking of federal gold. It could also be a joke perpetrated by someone like Edgar Allan Poe, an expert cryptographer who attended the University of Virginia briefly in the 1820s. A few speculate the National Security Agency already has cracked the ciphers and absconded with the treasure. We will never know, they say, because it's classified.

Within the Beale Cypher Association, nonbelievers are distinguished by their willingness to share information, says Frank Aaron, a Florida computer systems consultant who is working on a book on Beale with a do-it-yourself guide for home computer buffs. "If someone believes in the treasure, you bet they are very secretive about their work. They want to know what you are doing, though."

Only historical research will solve the Beale mystery, says Carl Nelson, who, with the patience of a veteran CIA agent, is cross-checking Beale's story. Did Beale go West as claimed? Did he find the gold, and if so, what did he do with it?

Nelson's sleuthing has taken him all over the country, from Virginia courthouses to Kansas, Missouri, Texas, New Mexico. He has investigated old newspapers, steamboat schedules, jewelry store receipts, church registries, and tax, school and bank records. So far, with the exception of an April 1, 1820, notice in the *Missouri Intelligencer* saying a letter awaited "Thomas Beall," Nelson has found no conclusive evidence that Beale was where he said he was at the time. On the other hand, he has found no evidence that he was not.

Nelson has a theory that the Virginian was stealing from his brothers. Indeed, if Thomas were put on a 20th-century couch, his mumblings to his analyst might lead to a suspicion of unresolved sibling rivalry. After all, according to Nelson's research, he had three brothers who owned 17,000 acres along the James River as well as the largest gold mine in the Blue Ridge. Thomas, according to an 1835 Fauquier County tax record, was taxed ten cents on his sole possession, a horse. Nelson also claims Beale died in 1851, a pauper in Montross, Virginia, although others contend he disappeared out West. Whatever his end, he left behind a good yarn if nothing else. "It's an endlessly fascinating puzzle," says Nelson, who is determined, quite literally, to get to the bottom of it.



Blazed oak on Dooley brothers' land may be a clue to the treasure—if it exists.

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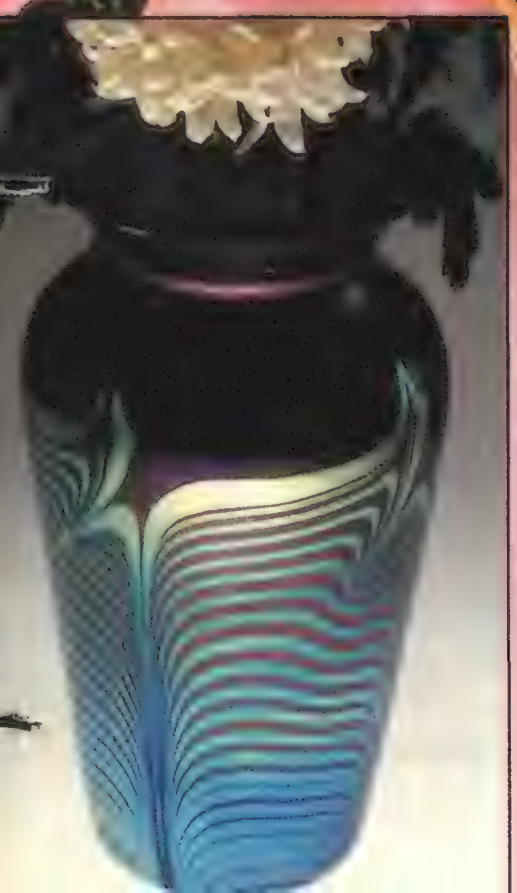

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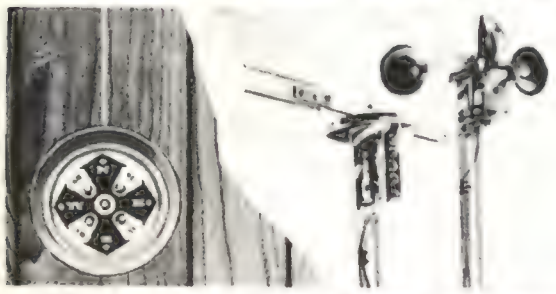

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Book reviews

The Wildlife Stories of Faith McNulty
Faith McNulty. Illustrated by Robin Brickman
(Doubleday, $17.95)

What good is a whooping crane? Who needs the manatee? Why save the indri? If anyone knows the answers to these questions, Faith McNulty does. She has communed with some of the world's most endangered creatures and painstakingly traced their paths from the dawn of their existence through the perils that have brought them to the edge of extinction. In this collection of essays she makes their cases with consummate skill, telling their stories in gripping detail and with a sort of cosmic compassion.

The road to extinction is a now-familiar way. The exhilarating trail to survival winds through the shadows of human greed and ecological ignorance and is largely unblazed and unlit. McNulty tries to show us the tedious process by which the light of knowledge and wisdom are translated finally into actions—all too often half-hearted—that just might prolong the twilight of existence for a lemur or a falcon or a whale. She touches in turn on all the forces that conspire to destroy precious habitat and then, inevitably, the creatures that live there. In Florida, where once the manatees could swim crystal rivers with safety and abandon, these "gentlest" of Earth's creatures now must swim polluted waterways through gauntlets of small-boat traffic, where "a ride on the river is almost like rush hour on the freeway." Chalk one up for the glories of a pleasure economy. And if a highway department needs crushed rock to pave a washout along the coast of Cali-

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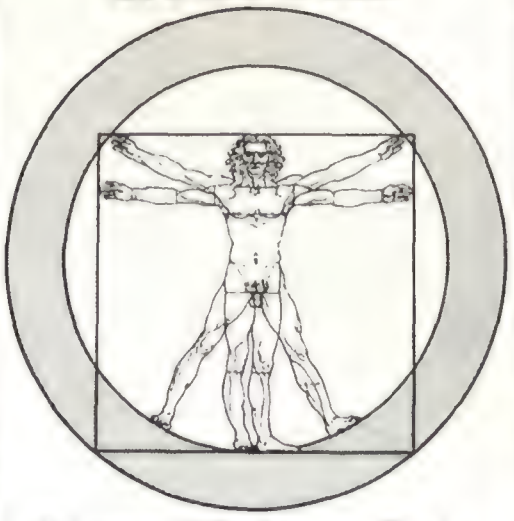

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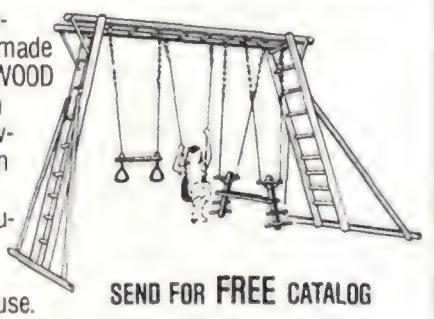

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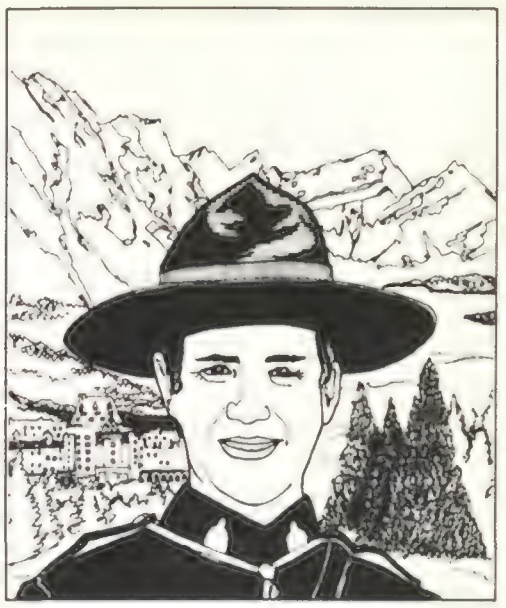
fornia or a would-be falconer wishes to thumb his nose at the law and at the same time at the heritage of us all, so be it. The peregrine falcons will simply have to make do. You may have your whales if they don't interfere with my margarine or lubricating oil.

The bad guys are not always easy to finger or to hate. There was the museum director whose zeal for his scientific collections led directly, if unwittingly, to the killing of the last pair of great auks on Earth. If we learn anything about the struggle from McNulty's pages, it is how ordinary, reasonable and well-meaning the enemy is, and for good reason, because we are all the enemy, hidden as this might be to us, in some manner.

When Faith McNulty tells a wildlife story she really tells a story. These are not your run-of-the-mill, sentimental, bedtime animal stories. They are research reports through the eyes and from the pen of a rigorously briefed layman. As a nature reporter of many years, she has the reporter's sense of what grabs and holds attention, but she does her homework uncommonly well. The heroes of her pages are the creatures themselves and the authorities who study them. Before she writes she lives and breathes the stories with the main characters on the center of the scientific stage, and her stories not only entertain but also teach and inspire. Her crisp, reportorial style sparkles with vivid description, wit, even suspense. Who wouldn't like to have one of her

Author McNulty visits with friends.



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hypothetical "Reverse Machines" now and again, to ingest four-lane highways and shopping centers and spew out lazy green pastures with contented cows? Anyone who has ever looked a cat in the eye understands at once when she talks about the "one-way glass . . . in the eyes of a feline, who looks out but doesn't allow us to look in."

Man's parallels with the lower animals are never far from mind. "Animals," she writes, "often share the same fate as other inarticulate minorities—they are cheated, exploited, and abused." She ponders the classic dilemma of welfare systems by example in the bird world: "Is the blue jay needy or greedy?" After calculating that her flock of jays costs her only a nickel's worth of sunflower seeds a day, surely, a most affordable price, she decides that the elaborate contraptions on some feeders to catch the welfare cheaters aren't worth the trouble.

Some of the 12 stories in this McNulty reader are anecdotal or whimsical ("Mouse," "British Mice," "The Ever Hungry Jay," "Woodchuck," "South County Notes"), but most are serious essays ("A Swim with a Manatee," "Koko Kissed Me," "The Whooping Crane," "And the Indri Sang," "The Great Whales," "The Falcons of Morro Rock," "A Desert Fish"). She is at her best in these longer pieces. Reading the chapter on the great whales is the next best thing to hearing world-renowned cetologist Roger Payne tell his own story in person. The song of the rare lemur called the indri that emerges from these pages is a cry for mercy. It is the all-but-forgotten tune on the flip side of Madagascar's progress march.

The epic of the book, which itself appeared as a book some years ago, is the story of the whooping crane. It is a story of the great and the small, the powerful and the powerless, the vindictive and the benevolent. Just about everybody has had something to do with saving the whooper, it seems. It is a story filled with irony, as when the director of Audubon Park Zoo falls into the position of petty czar, does about everything possible to obstruct captive breeding, and then becomes the first to claim success. There is high suspense as we search for the unknown breeding grounds and follow the annual check-in of young and adults on the Texas wintering grounds, or wait to see whether the captive Josephine will or won't lay fertile eggs this year. There is the tragic touch with Robert Porter Allen, who, more than any other, laid the groundwork for the whooper's recovery, dying suddenly before the fortunes of the crane had turned clearly around. Today he is almost forgotten. The whooping crane's story should be read by every citizen of the world who cares anything at all about the environment.

Most of the book has appeared in print before, much of it in *The New Yorker* and *Audubon* magazines. Those who have read McNulty the first time around will be delighted to have all these wonderful stories in one place. Those who, like me, have not read her before will not want to miss this treasure from a writer who gives the lie to those among us who would argue that great nature writing is dead.

—*Stanwyn G. Shetler*
Curator in the Department of Botany
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Ernest Hemingway: Selected Letters, 1917-1961
Edited by Carlos Baker
(Scribner's, $27.50)

At most literary critics, Ernest Hemingway sneered, denouncing the whole literary establishment as "camp following eunochs [sic] of literature. They won't even whore. They're all virtuous and sterile." Toward those critics who tried to delve into his personal life—"Junior F.B.I.-men, discards from Freud and Jung"—he could be even more vituperative and belligerent. It came as no surprise, then, when in 1952 Hemingway forbade publication of his most personal and revealing means of communication: his private letters.

Having respected the author's wishes since his self-inflicted death in 1961, Mary Hemingway, the writer's fourth wife and literary executrix, has at last wisely decided to allow publication of nearly six hundred of her husband's letters, dating from 1917 to 1961, superbly introduced and expertly edited by Hemingway's biographer, Carlos Baker.

Selected Letters is an extraordinary collection. "Often libelous, always indiscreet, [and] often obscene," the correspondence sheds light on every aspect of Hemingway's career, from his days as a cub reporter on the *Kansas City Star*, through his service in the two world wars and the Spanish Civil War, to his latter days as an aging, dispirited, lonely writer.

Helen Breaker, a friend in Paris, photographed Hemingway in 1928.

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In these unguarded missives, Hemingway often achieves the grand goal of his fiction: to present a subject as it is.

The subject here is himself—brawling and foul-mouthed, boiling with invective in one instance, tender and incredibly thoughtful the next; war hero, teller of tall tales, big game bwana and deep-sea fisherman; bullfighting and prizefighting know-it-all. Through all the safaris, fishing expeditions and bullfights, through all the wars, wounds and accidents, however, Hemingway is always the writer, the craftsman laboring to hone his art, to say more with the fewest possible words. He was always ready, he often boasted, to climb into the ring with Mr. Turgenev or Mr. de Maupassant or Mr. Tolstoy (only six rounds with him), or even Mr. Cervantes. "There are some guys nobody could ever beat like Mr. Shakespeare (The Champion) and Mr. Anonymous."

A compulsive correspondent, writing more than 7,000 letters during his career, Hemingway used letters as an escape from the grueling pressure of his trade, and as the best way of keeping in touch with friends and cronies. Without male companionship—Ernie, Hemmy, Heminstein, Stein, Papa, as he alternatively signed himself—felt lonely, lamenting in 1948: "There is no good talk anymore."

The good talk is in the letters, in the form of gossip ("What's the dirt?" is a refrain), badinage, boastings, confessions, musings, ravings, accusations, maledictions, fulminations, as well as political, literary and personal judgments. Hemingway never pulled a punch, was often cruelly candid and derisive. About his mother: "I hate her guts and she hates mine. She forced my father to suicide." "My Dear Cardinal," he addressed Cardinal Spellman, "In every picture that I see of you there is more mealy mouthed arrogance, fatness and over confidence."

The very best talk concerns his own art and that of others. Literary gossip is the main dish in this feast. Writing to his father, Hemingway succinctly states his *ars poetica*: "I'm trying in all my stories to get the feeling of the actual life across —not to just depict life—or criticize it—but to actually make it alive." "I believe," he wrote Arthur Mizener, "that basically you write for two people; yourself to try to make it absolutely perfect; or if not perfect then wonderful. Then you write for who you love. . . ."

In the world of Hemingway, however,

there was room only for himself. Toward other writers he was often contemptuous and abusive. As he grew older, his judgments became more mean-spirited and vengeful. Though he seemed fond of F. Scott Fitzgerald, begrudging Scott his golden talent, he bullied him, playing the schoolyard tough. Faulkner, Hemingway snapped, used only rhetorical tricks. Dos Passos grew soft. Anderson only imitated himself. Eliot was fair, but as a man "he never hit a ball out of the infield." An entire generation he could dismiss with the flick of a pen—or a boxing metaphor.

Hemingway's letters may indeed be vicious, destructive to others and to himself, teeming with coarse abuse and obscenities that are often childishly pathetic, but boring these letters are not. Every sentence—down to his misspellings and careless usage—mirrors a complex, often confused, perhaps even paranoid man who, to use an Auden phrase, will be pardoned for his excesses, pardoned for having written well.

—Paul Piazza

Washington critic, author of *Christopher Isherwood: Myth and Anti-myth*

Sand Rivers
Peter Matthiessen
Photographs by Hugo van Lawick
Viking, $19.95

The wonder of Peter Matthiessen's new book is the control with which he wrote it. A lesser writer might have transformed this account of a trek through the immense Selous Game Reserve in southeastern Tanzania into a proclamation of conservationist agitprop. The author of *The Snow Leopard*, among other notable books of fact and fiction, has, instead, let the place and its inhabitants explicate and justify their own existence.

Hippos cavort in a pan, or basin, in Selous Game Reserve.

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The temptation to preach must have been strong. Matthiessen's guide and companion was Brian Nicholson, a white African who was a warden in the reserve for more than 20 years, until he resigned in disillusionment in 1973. His dispute with the Tanzanian government centered on its "Africanization" of jobs and reduction in funding. From time to time Nicholson *does* vent his disgust with the neglected state of present-day Selous, and Matthiessen notes that the ex-warden persuaded friends in the government to authorize the trek in hopes that the international publicity from the book might help save the Selous. Despite this political purpose, however, Matthiessen manages to keep the text descriptive and unsententious.

Perhaps because their popularity might arouse interest in the Selous, Matthiessen seems to take special pains to conjure up the big mammals for his readers. He finds slapstick in the boisterousness of a hippo herd in residence at one of the reserve's characteristic pans (natural basins). "Periodically the cacophony of groans and blares, snorts, puffs, and sighs subsided with the submergence of raw, agonized heads, leaving only a mute cluster of shining wet boulders on the still surface of the pool. Then, one by one, the heads protruded, froggish pink eyes and round pink ears, followed by the generous nostrils that can close tight under water."

In contrast, the stolidity of two elephants standing in a river moves him to lyricism: "In the new light of the river morning, they seem to dream, lulled to forgetfulness of where they might be going by the clear torrent from the southern mountains that casts sparkling reflections up the gray columns of their legs." But Nicholson injects a troubling perception: the tusks are decidedly average in size, possibly because poachers have been butchering the big bulls. As for the African rhino, during the last decade it has fallen victim to a fad among rich Arabs for daggers with handles of rhino horn. The Selous total of about 5,000 rhinos "must be the last large healthy population of this species in the world."

The great Selous irony is that one reason for some declining animal populations may be lack of human interference. According to Nicholson, the grass that dominates the region furnishes nutriments during the rainy season. After maturation, it grows high, dries out, and

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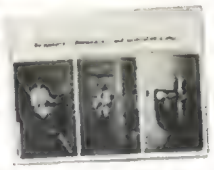

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loses its food value. For centuries Man solved the problem by burning the grass, encouraging it to revegetate; but with the region depopulated and its management ineffectual, the grass now grows unchecked. To Matthiessen's discomfort, as they travel Nicholson repeatedly puts the landscape to the torch.

At one point in the journey, Matthiessen muses on the tameness of most of the animals. It is not the same kind of tameness as in, say, the famed Serengeti National Park (also in Tanzania). There the animals are jaded by familiarity with Man. In the remote Selous they accept him with "trusting innocence." Conveyed in Matthiessen's words and Hugo van Lawick's photographs, this innocence makes the strongest possible appeal for the Selous.

—Dennis Drabelle
Washington attorney and critic

Sportsmen and Gamesmen
John Dizikes
(Houghton Mifflin, $15)

As benchmarks in the evolution of the American sporting style, no two structures could be more dissimilar than the Hermitage and the Astrodome. The former, sportsman Andrew Jackson's handsome, many-acred retreat, with its stables, servants and Old World architecture, smacked distinctly of traditional British culture. The modern-day stadium, by contrast, is a fully controlled environment offering highly professional, organized and businesslike entertainments for a mass audience.

In *Sportsmen and Gamesmen*, John Dizikes, a historian at the University of California at Santa Cruz, examines the lives and careers of some intriguing Americans of the early to mid-19th century, both well- and little-known, who played crucial roles in "The gradual transformation of the aristocratic sporting tradition into a popular one. . . ." At the same time, he reflects provocatively on the meaning of these changes in American sports and their relationships to the broader culture. The result is an engrossing work that brims with insights into American popular culture.

In Dizikes' view, the American sportsmen of Andrew Jackson's era—still drawn to the former mother country but determined to create an indigenous American culture—set in motion a "middle class,

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commercial, popular style" of sports life which continues to this day. Above all, the new style was characterized by the gamesman, who cared little for the traditional sporting gentleman's code of conduct, and was far more interested in simply winning. The gamesman—typified today by calculating coaches with elaborate game plans—brought a practical, objective and "scientific" attitude to sports. If winning meant stretching the rules a bit, so be it.

In his nicely drawn portraits of the period's leading figures, Dizikes points to traces of this gamesmanlike behavior as well as efforts that helped the gamesman to flourish. In horseman William R. Johnson, for example, he finds a cunning tactician and bettor, who presaged the independent manager and promoter of later years. In sports editor William T. Porter, he finds a tireless publicist for the practical, business aspects of sports, whose *Spirit of the Times* newspaper published tall tales celebrating the trickster-gamesman as an integral part of American life. And in Paul Morphy, the chess champion, he finds the "gamesman as mastermind."

Among Dizikes' other 19th-century sportsmen (they range from yachtsman John Cox Stevens to prizefighter John C. Heenan), it was P. T. Barnum, master of hokum, who epitomized the trend toward Astrodome sports. Barnum was "the archetypal manipulator and manager, who took the odd and aimless forms of play and converted them into complex games," says Dizikes. "The frontier trickster, the pokerfaced gambler, the Yankee con man—all these elements Barnum absorbed and shaped into his own vision of sportive amusement, a vision entitling him to be called the greatest of 19th-century gamesmen."

Along the way, the author offers sidelights on the development of sports (such as the volunteer fire companies' role as a focus for urban street games) and the carry-overs from games (such as "passing the buck," a poker term) into other areas of American life. Nor does he miss the irony, often evinced in the early 1800s, of Britain's quickness to praise America's newfangled ways, from the clipper ship to the trotting wagon.

Rich in stories and ideas, Dizikes' study is a thoughtful look back at the roots of our Super Bowl culture.

—Joseph Barbato
New York critic and columnist

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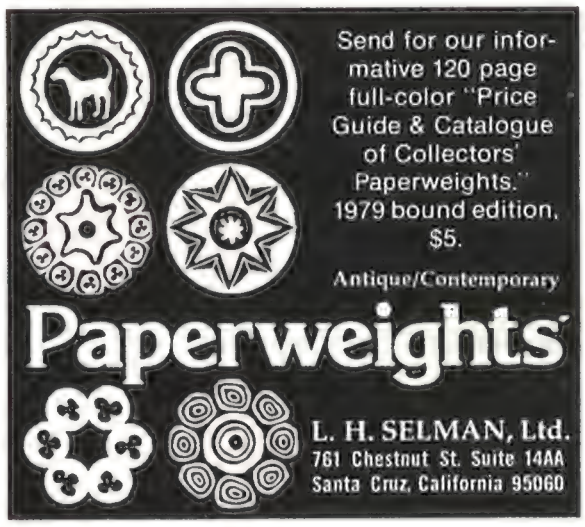
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Additional reading

Auction wars (p. 40)

Sotheby's: Portrait of an Auction House by Frank Herrmann, W. W. Norton, 1981

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Chimp rehabilitation (p. 90)

Chimps of Mt. Asserik by Stella Brewer, Alfred A. Knopf, 1978

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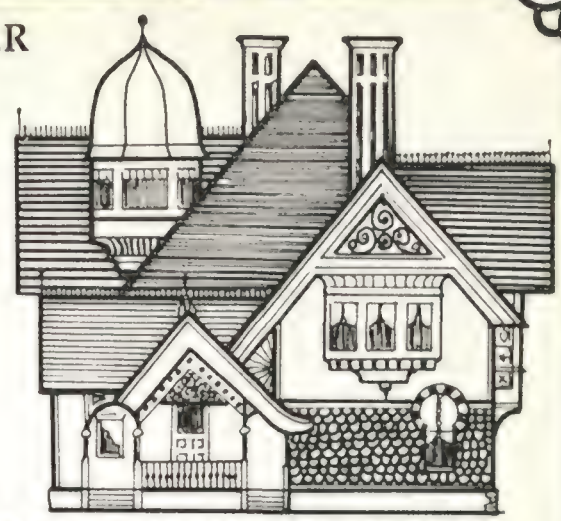

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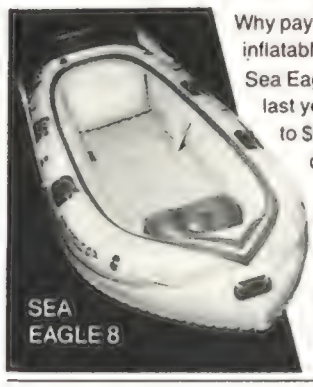

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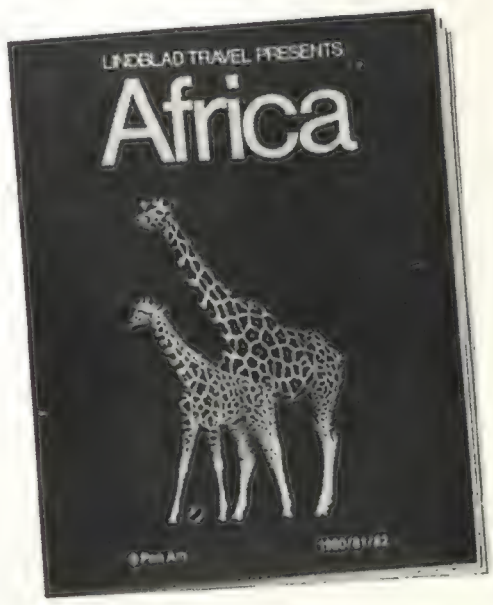

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Smithsonian highlights

Thomas Jefferson's scientific bent is uniquely illustrated by a new show at the Museum of American History. Many of the objects (right) come from Monticello or private collections—and many have never before been publicly exhibited. "Thomas Jefferson and Science," organized by Silvio Bedini, who is working on a book on the subject, offers a glimpse into the third President's forays into paleontology, ethnology, surveying, archaeology, agriculture and cryptology (p. 132).

Something that sounds like fun is Natural History's *On Stage* April 10 and 11, a musical program about insects and spiders. Dancer-choreographer Judith Janus stars in "Bugs, How to Taste with the Feet, Smell with the Knees and Wear a Skeleton on the Outside."

Special April events

National Museum of American History
Thomas Jefferson and Science (April 13-July 5)—Some special artifacts.
Egypt in America (through April 15)—Books on Napoleonic explorations.
American Bowed Strings (April 25-January 4)—Twenty-one musical instruments.
Free Films (Wednesdays, Thursdays, 12:30 P.M.)—Documentaries on transportation.

Cooper-Hewitt Museum (New York)
German Stage Design of the 19th Century (April 7-June 7)—Sets, costumes from German Theater Museum in Munich.
Innovative Furniture of America (through May 10)—Furniture technology.
John Henry Belter and the Rococo Revival (through May 24)—Victoriana.

Freer Gallery of Art
Ancient Egyptian Art (through May 31)—Colorful glass, 15th-10th centuries B.C.

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Museum of Natural History
On Stage (April 10, noon; April 11, noon and 2 P.M.)—Free family musical program.
Noon Films—"Solo" and "John Muir's High Sierra" (April 17); "The Sons of Haji Omar" (April 24)—Film and discussion by Dr. William Trousdale.
Photographing the Smithsonian (April 3, noon)—Lecture with basic tips.

Museum of African Art
Ancient and Contemporary Art of Egypt (through May 15)—Costumes, jewelry.
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National Portrait Gallery
Portraits in Motion—John Daniel Reaves in "Mencken in Spring: Reveries of an Iconoclast," April 4, 1:30 and 3 P.M.; free, reservations suggested.
Bret Harte: Chronicler of the Gold Fields (through July 12)—Portraits, poems.
Photographs (through April 19)—Selections from the permanent collection.

National Air and Space Museum
View from the Tropics: Maya, Aztec and Inca Astronomy (April 15, 7:30 P.M.)—Lecture in the Spacearium.
The Cometferret's Catalog (April 4, 9 A.M.)—Monthly sky lecture, Spacearium.

Renwick Gallery
The Grand Beehive Exhibition (April 24-December 13)—A look at Utah (p. 165).
The Animal Image: Contemporary Objects and the Beast (through August 30).
Egypt Today: Embroidered Pictures from Akhmim (through April 26)—Tapestries.

Hirshhorn Museum & Sculpture Garden
Directions 1981 (through May 3)—A look at some of today's art (p. 162).
Robert Natkin: A Lithographic Suite (through June 14).
Mahmoud Mouktar (through April 30)—Sculpture by this Egyptian artist.

National Museum of American Art
Aspects of Collecting the Modern: 20th-Century Painting and Sculpture in NMAA (through May 5).
Art from the Vice-President's House (ends May 17)—Sixty works.

Smithsonian events

For tickets to April Resident Associate Program events, call 357-3030:
Egyptian Cinema Today—Six Wednesday-evening films beginning March 25.
Architecture for the Poor in Egypt (April 16, 8 P.M.)—Architect Hassan Fathy discusses innovations.
The 19th-Century American Home: Taste and Decor (April 4)—All-day seminar.
Chateaux of the Loire (April 21, 8 P.M.)
The Ionian Islands (April 27, 8 P.M.)
Search for Black Holes (April 28, 8 P.M.)
Space Shuttle Update (April 22, 8 P.M.)

For tickets to Performing Arts events, call 357-1500:
Frog Print Theatre (April 2-May 3)—Meet Archie the Frog, Wednesdays-Sundays, A&I Discovery Theater.
Bob Brookmeyer and Curtis Fuller (April 4, 5; 6 P.M.)—Jazz trombone.
Harmonizing Four (April 12, 3 P.M.)—Gospel music.
Patsy Montana, Pee Wee King and Redd Stewart (April 26, 8 P.M.)—Country music.
20th-Century Consort (April 12, 7 P.M.)
Classical Quartet (April 13, 8 P.M.)

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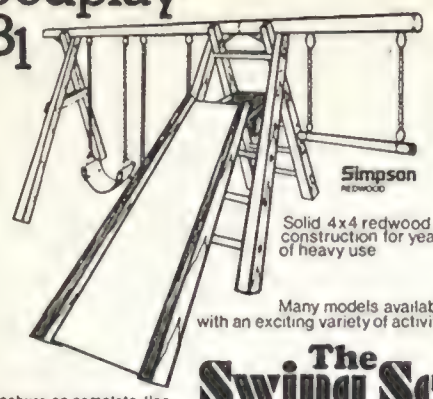

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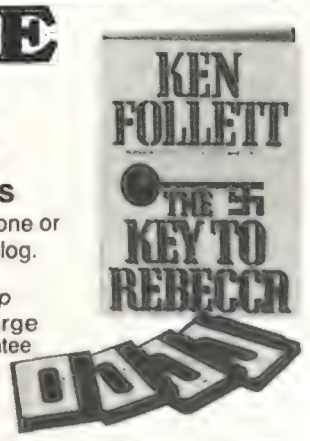

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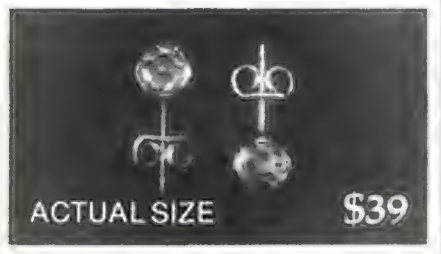

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Radio Smithsonian, a weekly half-hour visit to exhibits and performing arts programs, is heard nationwide on some 65 stations. Smithsonian Galaxy, a series of twice-weekly, 2¼-minute features, is broadcast by 200 stations. To find out which station in your area carries either program, write: Office of Telecommunications, A&I Building, Room 2472, Smithsonian, Washington, D.C. 20560.

Regional Events

Miniatures, Native American history and plate tectonics are among the topics scheduled for the Regional Events Program in Kansas City, Missouri, April 21-29. Associates in the area should have received invitations to the series which is cosponsored by local cultural and scientific organizations. For further information, write to: Regional Events, 1208 A&I, Smithsonian Institution, Washington, D.C. 20560.

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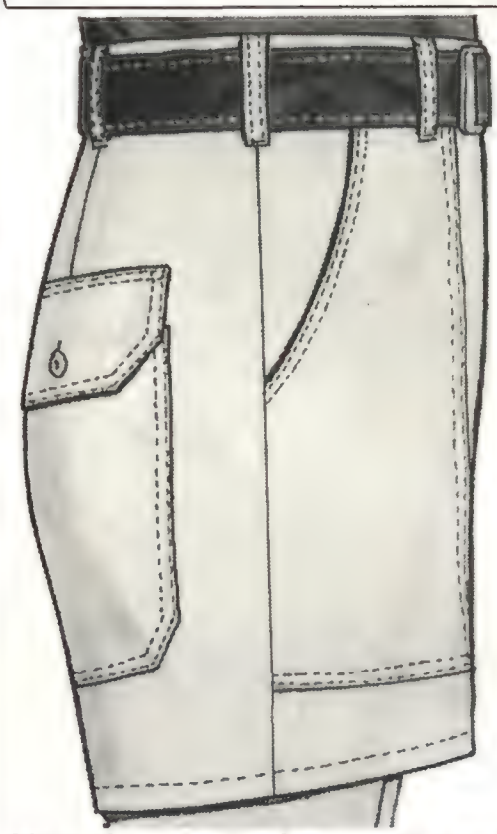

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Tempe, Arizona (March 28-April 26)—*Cut on Wood,* Arizona State University.

Santa Ana, California (April 11-May 17)—*Berlin Porcelain,* Bowers Museum.

Tequesta, Florida (March 28-April 26)—*Children's Art from the People's Republic of China,* Lighthouse Gallery.

Logan, Kansas (April 19-May 17)—*Designs of the Ndebele,* Dane G. Hansen Museum.

Lexington, Kentucky (April 11-May 10)—*Musical Manuscripts,* University of Kentucky Art Museum.

Vineland, New Jersey (April 4-May 3)—*Butterflies and Moths,* Cumberland County College Library.

Rochester (April 11-May 10)—*World Print III,* University of Rochester.

Oak Ridge, Tennessee (March 28-April 26)—*Mexico As Seen By Her Children,* Children's Museum of Oak Ridge.

Seattle (April 18-May 31)—*The Child in America,* Seattle Center.

Chicago (April 4-May 3)—*Black American Graphics,* School of the Art Institute of Chicago.

Dayton, Ohio (April 25-May 24)—*Alvar Alto,* Lorenz and Williams, Inc.

Littleton, Colorado (April 25-May 24)—*The Year of the Hopi,* Arapahoe Community College.

Baton Rouge (April 11-May 10)—*Erté,* Louisiana State University.

Detroit (April 18-May 17)—*Buildings Reborn: New Uses, Old Places,* Detroit Historical Museum.

Moorehead, Minnesota (April 18-May 17)—*Black Women: Achievement Against the Odds,* Concordia College.

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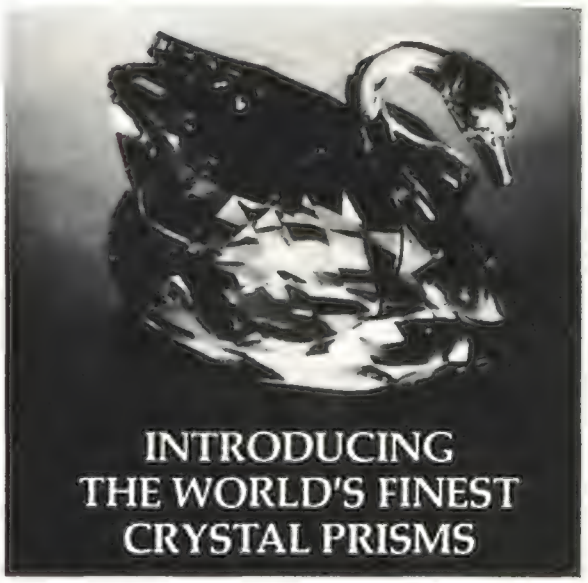

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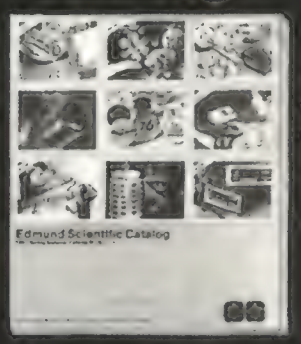

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The 18i Sportswagon silhouette is notably slippery. A wide front modesty panel—more discreet than add-on air dams—encourages turbulence to slide beneath the 18i. Slip stream styling effects promote excellent fuel efficiency* as the wagon carves the air.

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The 18i Sportswagon is masterfully tuned for the road. With 155SR x 13 Michelin steel belted radials, box section "live" rear axle (it flexes in the turns), front and rear sway bars, and beefy helical coil springs (variable-flex in the rear) surrounding long-travel shock struts.

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The 18i's elegantly tailored seats are bio-formed with special support for the lumbar region and upper thighs.

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*EPA estimated at 25 mpg. 38 mpg highway est. Remember: Compare this estimate with estimated mpg for other cars. Your mileage may differ depending on speed, trip length and weather. Your highway mileage will probably be lower.

Renault 18i

More than just economy

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Utah's busy beehives

When an exhibition on Utah's state symbol, the beehive, was proposed, Allen Dodworth of the Salt Lake Art Center considered it "a delightful but ridiculous idea . . . worth pursuing." The result was "The Grand Beehive Exhibition," an eclectic collection of crafts and art that opened at the Center, wound up as a colorful book, and comes to the Renwick this month. The exhibit is a honeyed testimony to society's love of symbols.

The symbol at hand is actually out-of-date: a woven half-sphere called a skep that throughout history has symbolized the industry, sweetness and harmonious community life of the bee. Modernization in the 19th century replaced the skep with the movable-frame box hive; science took away some of the spiritual aura that surrounded the bees' life. But in Utah the beehive, as a symbol, remained.

Why Utah? As with most folk icons, the beehive's history is not defined. It long has been linked with the Mormon religion and gained importance with Brigham Young and his followers as they moved West, seeking a "land of milk and honey." As a protected structure with no windows to the outside world, the beehive had special appeal to the close-knit pioneers. It signified industry, organization and self-sufficiency—qualities which later appealed to the secular state as well.

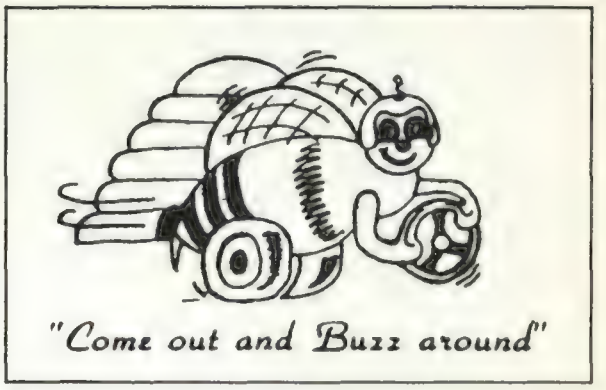
Today the beehive is regarded both as a secular and religious motif, and is represented along with the American eagle on the state seal. Just how pervasive it is became apparent when the call went out for objects for the exhibition. "One woman had 80 ceramic beehives in her bedroom," said Hal Cannon of the Utah Arts Council, which organized the exhibit. Beehives are visible on office stationery, fire hydrants, temple towers, quilts, totem poles, gravestones and pop bottles. As Cannon says, "In Utah, beehives are a matter of course." Of course.

—Carol Simons

Shoshone beaded bag is among crafts at Renwick's "Grand Beehive" exhibit.

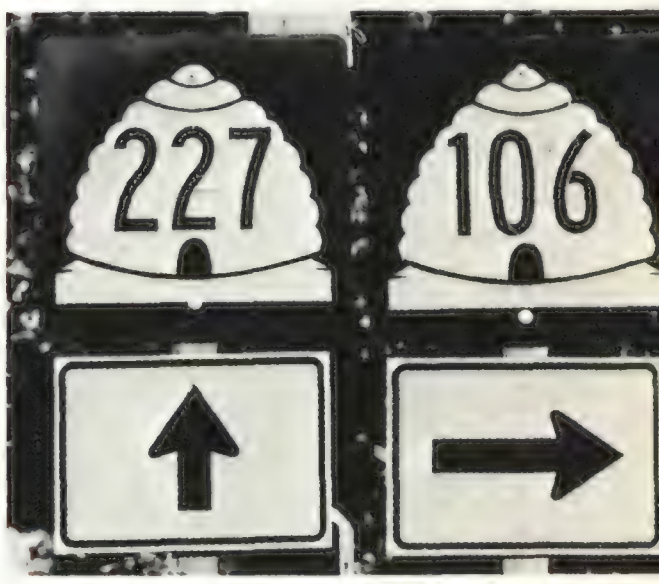
"Rye king" Fritz Haertel runs bakery, came to Utah in early 20th century.

Sign at state fairgrounds in Salt Lake City boldly boasts state symbol.



Beehives and industrious bees are popular on Utah business letterheads.

Many utilitarian objects use motif, such as these salt and pepper shakers.



Road signs in Farmington display symbol; so do state highway patrol cars.

Snelgrove's has offered molded ice cream treat for nearly half a century.

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Southwest Pueblos—May 22-29: Trace the unique development of Indian and Spanish cultures in colorful New Mexico.

Illinois Archaeology—May 23-30: Join dig that spans nearly 10,000 years. Includes instruction, lab work and field trips.

Yosemite—June 6-14: Granite spires, soaring waterfalls, giant sequoias. Explore the park at its peak season.

San Francisco—June 14-20 or September 20-26: An in-depth view of the city's social and architectural history. Museum visits, bay cruise, evening events and concerts.

Family Sampler—June 25-28: Special program for parents and children (ages 7-14) to enjoy behind-the-scene activities at five Smithsonian museums and the National Zoo.

Glacier National Park—July 4-13: From prairie and forest to treeline and summit: learn the story of varied life zones, explore Glacier's dramatic terrain and enjoy the comforts of a lodge at night.

Desolation and Gray Canyons—July 22-August 1, September 30-October 11, or October 12-23: A white-water trip for the adventurous on Utah's Green River.

Salmon River—July 28-August 4: Spectacular mountain scenery; see bears, bighorn sheep and pine forests while rafting in Idaho's vast primitive area.

Grand Canyon—August 14-24 or August 22-September 1: The light and shadow of a sublime natural spectacle, seen on a raft trip down the Colorado River.

The North Woods—August 20-28: Minnesota's lakes, streams and hardwood forests are the setting for a hiking and canoeing natural history program.

Hopi and Pueblo Country—September 14-23: Enjoy autumn colors in the Southwest's canyons and mesas with visits to Mesa Verde, Chaco Canyon and Hopi reservation.

California Wine—October 4-10: Visit selected vineyards for tasting and lectures with distinguished wine masters.

Washington "Anytime" Weekend: Choose any weekend to visit your choice of Smithsonian museums, spend two nights at Loew's L'Enfant Plaza Hotel or Hyatt Regency Washington, each close to the Mall, and see other sights in the city by Tourmobile. Reservations and payments at least ten days prior to arrival.

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These tours range in size from small group experiences to charter adventures and vary in price from low cost to deluxe, depending on the type of travel, destination visited and length of trip:

Mediterranean Spring—April 25-May 6: A remarkable cruise on MTS *Argonaut* combines the brilliant beauty of the Mediterranean Islands with a fascinating study program by outstanding lecturers.

People's Republic of China: Eight tours from May through November with three different itineraries; important cities and archaeological sites, Chang Jiang (Yangtze River) gorges.

Springtime in Greece—May 3-19: Athens' Acropolis, museum visits and special events are followed by a rare chance to visit the awe-inspiring backcountry.

Portugal—May 5-19 or October 6-20: Enjoy Lisbon's diverse charms and gentle character; sample the rich variety of the historic coastline and hinterland.

Odyssey of Flight—May 24-June 8: Paris Air Show, the Musée de l'Air, Britain's Shuttleworth Collection and more, with Air and Space Museum curators.

Malaysia, Borneo and Singapore—May 25-June 12: Kuala Lumpur, Penang and Malacca plus a look at celebrated handicrafts of the East Coast; wildlife in remote Taman Negara; or a safari in the jungles of Borneo.

Wild Highlands of Scotland—May 28-June 13: Mountains, lochs, crofters, eagles and moors; a natural history program in a castle near ancient Caledonia forests.

Alpine Countryside—June 6-21 or September 12-27: Study folk art and architecture, flora, fauna and geology in a charming Austrian mountain village.

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Wales—July 4-17: Savor dramatic landscapes, visit archaeological sites, fishing villages, mines, manor houses and old castles; attend the International Music Festival at Llangollen.

Finnish Lakes—July 10-26: An extravaganza of cultural happenings, the Savonlinna Opera Festival, plus music, design and architecture in Helsinki.

An Alpine Walk—August 2-16 or August 16-30: A 125-mile hike through the Swiss Alps to study peaks, waterfalls and flora.

Oxford/Smithsonian Seminar—September 11-26: Archaeology and Oxford landscapes are among ten in-depth courses taught by Oxford faculty. Live in Worcester College with visits to Cambridge, Bath and Stratford for a performance.

The Ancient World of Peru—September 20-October 6: Cruise along the coast visiting major archaeological sites; then stay in Cuzco; explore colorful markets and visit amazing Machu Picchu.

Salzburg Seminar—October 3-17: Study opera or the Baroque era in the lakeside setting of Schloss Leopoldskron; includes German lessons, lectures on Austria, visits to museums, theater and concerts.

Write National Associates, A&I 1278 Smithsonian Institution, Washington, D.C. or call (202) 357-2477 *for specific tour brochures or*

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Now is the time to enjoy the latest popular programs at the Smithsonian which combine excellent speakers and small, specially arranged behind-the-scenes tours. Choose from:

Naval History—April 26-May 1: Nationally famous authors, including Edward L. Beach (*Run Silent, Run Deep*), E. B. Potter (*Nimitz*), Norman Polmar (*Atomic Submarines*) and Edwin Simmons (*The United States Marines 1795-1975*), contribute their unique expertise along with tours of the rich and varied museums and naval facilities in Washington and Annapolis.

Historic Horticulture—May 3-8: Celebrate spring in the lovely 18th-20th-century gardens of Mount Vernon, the National Arboretum, Dumbarton Oaks, and the du Pont estates of Longwood and Winterthur.

American Antique Furniture—September 20-25: Connoisseurship of masterpieces, 1650-1840. Includes color slides of great collections, detection of fakes, care of antiques, and tours of the elegant Diplomatic Reception Rooms at the Department of State and the Winterthur Museum.

Chinese Ceramics—September 20-25; November 15-20: Connoisseurship of the unsurpassed masterpieces which have captured the world's interest and imagination for centuries. Includes tours of the Freer Gallery's outstanding collection.

Genealogical Research—September 27-October 2: Taught by Milton Rubincam, the "dean" of American genealogy, Marilyn Duncan and other leading authorities, participants learn how to conduct research in major genealogical repositories such as the National Archives, Library of Congress and the DAR Library.

Aircraft Restoration: How To—October 4-8: Master craftsmen who restore the famous planes in the National Air and Space Museum offer workshops at the Paul E. Garber Facility (formerly Silver Hill) on the many various techniques used.

Coming:

Tibet: Lost Horizons—October 18-23.
Paintings of Post Impressionist Masters—October 25-30.
Historic House Preservation: How To—November 1-6.

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By Roy Meador

Let's hear it for those poor endangered mules

Mainly what I miss while living in a city, driving an automobile and worrying about the future, is mules. Those animals represent an old order of things, serenity, an abiding sanity that helps me believe in the possibility of rational tomorrows. But now I must worry even about the survival of mules.

In 1850 mules did a major share of the nation's work. Today mulepower contributes less than one percent and the whole country is neurotic about where its next erg is coming from. This is progress? As a muleophile, I urgently ask the experts and anyone who will listen if there isn't a clear connection between the decline of mules and the increase in the chronic social, energy and psychic bellyaches of our time. A case can be made.

My finest excursion on muleback was down Bright Angel Trail at the Grand Canyon, starting in mid-morning one summer. We journeyed from the anxious 20th century on the southern rim toward the Archeozoic, billions of years below. My mule brayed philosophically as if to argue with the restless spirits of the place. Riding muleback down the Grand Canyon is an event of metaphysical mulesense that should not disappear. John Wesley Powell wrote that the Indian name for the Canyon is Pa-ru-nu-weap, "Roaring Water Canyon." Nearing the bottom, we heard the Colorado. The mules headed for the roar.

When I was a boy in Oklahoma, my best friend for several years was a slow, steady, hardworking mule named Hunnicutt after the film actor Arthur Hunnicutt, my favorite. That mule had an adventuresome spirit and was ready to go anywhere at any time. No conceivable vehicle could equal the efficiency of Hunnicutt for mileage based on fuel intake. We rode the red hills of Oklahoma and often ventured farther west. (On lazy summer afternoons, it wasn't unusual for us to keep going when we reached the Pacific. We crossed the ocean to Asia, then finished a circuit of the Earth, returning home by supper.)

Hunnicutt had a pooka streak in him, like Elwood P. Dowd's rabbit friend, Harvey, only soberer and more reliable. Hunnicutt was melancholy, took a while to make up his mind and had eccentric mannerisms, but he wasn't obstinate.

Similarly, my mule at the Grand Canyon was an extraordinarily good type whom I promptly christened Hunnicutt II. He was neither flippant nor playful, but all business. That's the kind of mule you want on Bright Angel Trail. Down that steep and winding route, the heart's supreme desire is for a mule with no appetite for joking.

Joseph Wood Krutch wrote that mules sometimes terrify canyon riders "by facing meditatively outward toward the abyss." Hunnicutt II did this twice, but I was not apprehensive. I know mules better than I know myself or my Congressman. Mules are too sensible for rash or impetuous deeds. Hunnicutt II simply wanted to gaze at the colossal gorge, absorb the grandeur of a landscape that took eons to form. Together we returned to the first minutes of eternity, communicating with those stone temples that grow skyward.

Mules are rightfully proud of their long history. Mule-breeder George Washington in his will bequeathed "42 working mules . . . 15 younger ones. . . ."

Meriwether Lewis and William Clark, according to the journals of their expedition, could trade "an axe, a knife, a handkerchief and a little paint" to the Indians for a horse—but a mule cost "2 knives, a shirt, 2 handkerchiefs and a pair of leggings." And when Abraham Lincoln was told the Confederates had captured a general and 40 mules, he replied, "I'm sorry to lose the mules."

Mules pulled the first Concord stages west of the Mississippi. During the 1880s, 20-mule teams hauled borax from Death Valley to help clean up dirty America.

In World War I, 5,000 Army mules died, and in World War II mules carried food and supplies to soldiers in the mountains of Italy. Then progress, so-called. The Army in 1957 replaced mules with helicopters. At least West Point still has a mule mascot.

Deep in the Canyon, sometimes I walked and led Hunnicutt II. Kipling's lines rang true: "Smokin' my pipe on the mountings, sniffin' the mornin' cool,/ I walks in my old brown gaiters along o' my old brown mule." To experience the Grand Canyon, not just see it, a mule of Pa-ru-nu-weap is the only companion.

"Give a man a horse he can ride," urged poet James Thomson without explaining his peculiar request. I prefer a mule, as surer-footed, wiser, sturdier and with more stamina to get you there from here. It seems inevitable that mules must return, because it is unlikely the human race can survive without them.

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